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ABSTRACT

This book argues that schools are doing a better job than is commonly portrayed by the media and various commission reports. However, it cautions that schools must move beyond incremental improvements. One need not assume school failure to propose school reform. Chapter 1 examines limitations of the research that has portrayed a national educational crisis, especially the report, "A Nation at Risk" (1983). The perceptions of a troubled educational system are fueled by the latest focus on economic threats, the media, and educators. Chapter 2 shows that previous examinations of schools have failed to take into account many of the subtleties in the data. It also argues that the social context in which schools function is declining, which is overlooked by many reports. Therefore, an objective systemic approach is needed to understand schools and the environment in which they operate. Chapter 3 gives further reasons for using a systems approach. The remaining eight chapters are devoted to: the changing concepts of learning theory; applying a consumer approach to setting standards; adopting authentic assessment; examining the problems with school choice; providing equitable funding; defining the system and its goals; providing comprehensive programs to ensure student readiness; and preparing for the impact of technology on education. Thirteen figures are included. Each chapter contains references. (LMI)

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TRANSFORMING AMERICA'S SCHOOLS:

AN Rx FOR GETTING PAST BLAME

By Gerald W. Bracey

EA 026 752

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PREFACE

Just what is the condition of American education today? Like the old adage, there's good news and bad news. The good news is our schools are doing a good job. The bad news is they may need to be doing a different job. On the other hand, our public schools are poised to make changes in the system that will lead to students who are even better prepared for life in the 21st Century.

Transforming America's Schools, prepared by noted research psychologist and education writer Gerald W. Bracey, goes beyond previous "Bracey Reports on the Condition of Education" to pose a strong case that schools are making great strides with children. Then, it points school leaders in the direction of systemic changes that must be made to transform, not just reform, our nation's schools. We urge educators and others who care deeply about public education to draw from what this inspired publication has to say.

Bracey has plowed through a virtual mountain of data on the status of learning and achievement in the public schools. What he has found, in case after case, is that the gloomy pictures painted by various commissions and news media reports often have been grossly exaggerated.

In fact, the reports have been countered by recent surveys, such as the Gallup Poll on public attitudes toward public education and a 1994 American Association of School Administrators public opinion study. Both have shown that most citizens, while always wanting their schools to do better, feel they are doing a very good job.

What does *Transforming America's Schools* have to say to school leaders? First, it tells us that educators need a pat on the back for leadership that has led to success for so many of our citizens up to this point. Second, in my opinion, it makes clear that we need to move beyond incremental, step-by-step improvements, because we are living in a fast-changing environment.

To make these changes, educators, parents, nonparent taxpayers, leaders in business and government, in fact everyone, needs to lend support as our nation transforms its school systems. Our children deserve no less. They, after all, will be our leaders in the 21st Century.

This publication is another reflection of the new AASA, an organization with a proud history dating back to 1865, but moving today on the cutting edge of positive change.

Paul D. Houston
Executive Director
American Association of School Administrators

INTRODUCTION

As a prisoner of the Germans in World War II, novelist Kurt Vonnegut spent part of his life in a Dresden meat packing plant. While he was there, the Allies firebombed this supposedly "safe" city—killing 135,000 people. Vonnegut survived, protected by the cold and damp of the underground slaughterhouse. But he was forever haunted by his memory of the city's destruction.

In an opening chapter of *Slaughterhouse Five*, his novel about the experience (Slaughterhouse Five was the address), Vonnegut tells a friend of his Dresden-inspired intent to write an anti-war book. The friend's wife became furious. "Why don't you write an anti-glacier book!," she says. She meant that anti-war books no more stop wars than an anti-glacier book would stop a glacier.

A reader could look at the title of this publication and wonder why I didn't write an anti-glacier book. Do we need yet another examination of the nation's educational system?

Obviously I and AASA think so, and that's partly because of what I bring to such an enterprise: formal training in developmental and cognitive psychology; a decade of writing monthly research columns on educational and psychological research; and research on computers; work in developing innovative assessment techniques over the last 15 years; and experiences in state, local, university, and private educational institutions. I believe this background permits some singular perspectives on what is—or is not—happening in schools.

In fact, it was my previously published perspectives that led to the document in your hands. I'm speaking particularly of three earlier essays known as the First, Second, and Third "Bracey Report on the Condition of Public Education," published in *Phi Delta Kappan*.[1,2,3]

The First Bracey Report developed over a period of about two months in late 1990. I had found myself, almost by accident, in possession of a mountain of data on achievement tests, SAT's (Scholastic Aptitude Tests), dropout rates, international comparisons, and other indicators that compelled me to conclude the conventional wisdom that American education had failed was wrong.

Earlier that fall, I had been like most American parents. I thought the local public schools my children had attended were "okay," but elsewhere there was a crisis in education. In fact, I thought the education my children had received in Virginia and Colorado was superior to mine. For example, their biology courses dealt with enzymes, complex biochemical reactions, genetics and evolution, and ecology. I had memorized phyla. Yet report

after report from various commissions and in the news media depicted a school system in crisis.

A change of heart. Then I came across an essay by syndicated *Washington Post* columnist Richard Cohen, entitled "Johnny's Miserable SAT's."[4] I knew the situation was not as deplorable as Cohen felt, but I also knew that almost 15 years had passed since a College Board-appointed commission had taken a close look at the trends. In addition, I had always felt that the commission headed by former U.S. Secretary of Labor Willard Wirtz had made a fundamental error in its 1977 inquiry. Because of Cohen's piece and my feelings about the *Wirtz Report*, I undertook an analysis of SAT score trends. Using the methods friends at the Educational Testing Service called "reasonable," I found only a 22-point decline in the verbal score and a 5-point rise in the mathematics average since 1951. Clearly the situation was much healthier than Cohen thought or than was commonly reported and widely believed. I published that conclusion in *Education Week* as "SAT's: Miserable or Miraculous?"[5]

That article prompted a number of colleagues around the country to send me or direct me to various other studies that also indicated that our nation's educational system was in better shape than commonly believed. A 1990 essay by Iris Rotberg of the National Science Foundation concluded that the international comparisons often used to flagellate schools were fundamentally flawed.[6] About this same time, I was asked to do a report on local, state, and national dropout rates and found them much lower than often reported in the print media.

Next, I received a phone call from a group of engineers at Sandia National Laboratories in Albuquerque, New Mexico. It seemed that then-U.S. Secretary of Energy James Watkins had delivered a speech at Sandia in which he said education was to be a Sandia priority. Being systems engineers, the Sandia group decided they had best study the system Watkins had directed them to pay attention to. In the process, they had collected many data that corroborated mine, they said, and wanted to share them with me.

After they presented their findings, I suggested we put all the results together and publish them somewhere. They demurred, saying they were "buried in internal politics." But they also said they had no proprietary interest in the data, most of which they had taken from public documents published by the U.S. Census Bureau, the U.S. Bureau of Labor Statistics and, especially, the U.S. Department of Education. They encouraged me to go it alone and I did.

Taking all of this information and much more that soon came along in documents such as *Accelerating Academic Achievement*,[7] a summary of NAEP trends; and *Performance at the Top*,[8] a report on high scoring students and tough tests; I wrote an article called, "Why Can't They Be Like We Were?" The title, a piece of a lyric from the 1960 musical, "Bye Bye Birdie," reflected the impression I had gotten from many people who criticized today's schools. They often waxed nostalgic about some "Golden Age" of American education from which we had declined and to which we should return. (The timing of this Golden Age varies; it usually turns out to be when the rememberer was in school.) (As for the Sandia analyses, after two years of alleged suppression by the Bush administration, the report, "Perspectives on Education in America," was published as the entirety of the May/June 1993 issue of the *Journal of Educational Research*.[9])

After "Why Can't They Be. . ." appeared in the October 1991 issue of *Phi Delta Kappan*, even more peers called my attention to additional information. In a few months, I had sufficient new material to propose a follow-up article to the *Kappan* editors. It ended up being the "Second Bracey Report on the Condition of Public Education," "Why Can't. . ." now being considered the first.

Shortly after "The Second Bracey Report" appeared, I was approached by AASA leaders who found the arguments of the two reports compelling—but were wondering what came next. They asked, "Where do we go from here to improve education?" It is hoped that this document will provide some answers.

At the time this book went to press, we were approaching publication of the "Fourth Bracey Report." *Kappan* editors believe, and I concur, that the Bracey Report and others like it should appear annually as long as there is sufficient new data to merit their publication.

Conclusion

At the risk of being redundant, let me be clear about my position: One need not assume school failure to propose school reform. In one article about the current fad of "reengineering" in business and industry, I recall one CEO of an already profitable company saying something like "We just decided to sit down and ask '"if we were designing our company today, what would it look like?"' That sounds like a healthy approach to change. The American educational system was not "designed," really, so it may pay big dividends to ask how it might better accomplish its goals.

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CHAPTER ONE

'A NATION AT RISK' AND OTHER QUESTIONABLE LOOKS AT EDUCATION

Beginning more than a century ago, at least as early as 1883, many individuals, committees, and commissions have examined the U.S. educational system and found it wanting. Indeed, criticism waned only during the Great Depression and World Wars I and II, when people presumably had other things to think about. Otherwise, the negative tone and content of the century's studies of education have been remarkably constant.

Shedding New Light on 'Risk'

This publication's present examination of education's critics begins with "A Nation at Risk,"[1] which put education in the public eye as never seen before. "Risk" stimulated reform efforts great and small that have been sustained for a decade and show no sign of diminishing. Given its significance, it's important to put this seminal document in perspective.

Based on wrong conclusions

In examining the educational system, we must distinguish clearly between where we are and what it means to be there, and where we want to be and what it will take to get there. These are independent issues, but often not treated as such. As with a number of earlier reform documents, "Risk" confused the two and linked them unnecessarily. Much of the attempted educational reform that followed this "paper Sputnik" also mistakenly coupled an appropriate desire to improve education with an inappropriate assumption that the system had failed. The authors of "A Nation at Risk" observed that educational systems in other countries were catching up to us. They argued that this would have been "unimaginable" a decade earlier. The authors of "Risk" might have seen the gains of other nations as natural phenomena—events to be expected as these other countries thrived. Germany and Japan certainly had no place to go but up after the second World War. Beyond that, it would have been against the character of nations to sit around contentedly, allowing the United States to dominate education and world affairs other than military.

"Risk's" drafters, however, did not reach this conclusion. Instead, they attributed the narrowing differences among nations to a dangerous decay in the U.S. education system. Although they wrote in the introduction that,

"The Commission was impressed during the course of its activities by the diversity of opinion it received regarding the condition of American education," no such diversity characterized the final report. "Our nation is at risk," declared the opening sentence. "Our once unchallenged preeminence in commerce, industry, science, and technological innovation is being overtaken by competitors throughout the world."

One could wonder, as educational historian Lawrence Cremin later did, how large a role schools really played in these changes. The authors, however, left no doubt with their cold warrior rhetoric:

> If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war. As it stands, we have allowed this to happen to ourselves. We have even squandered the gains in student achievement made in the wake of the Sputnik challenge. Moreover, we have dismantled essential support systems which helped make those gains possible. We have, in effect, been committing an act of unthinking, unilateral educational disarmament.

An inappropriate use of the SAT

To be sure, some indicators had declined. At the time "Risk" appeared, the national average score on the SAT (Scholastic Aptitude Test) had an unbroken fall of 20 consecutive years. But that was then. The national SAT scores and trends have subsequently been revealed as much more complex than previously thought and highly misleading. Their complexity and illusory nature are discussed later. For now we note only that since the Wirtz Committee made its report in 1977, each minute change in the SAT has been front page news—making the SAT the leading indicator of educational health.[2] Although the Educational Testing Service and the College Board repeatedly have denied that the SAT reflects anything about school quality and even changed the name in 1994 to Scholastic Assessment Test, it is still viewed that way by many, including those who composed "A Nation At Risk."

Moreover, "Risk" authors accepted the decreased standardized achievement test scores of high school students in the '60s and '70s as valid indicators of decline. They failed to notice, however, that the drop had halted and that scores had been rising for eight years prior to the publication of their document. Nor did they mention that this was not the case for elementary scores. They commented only that the scores were lower than when sputnik was launched.

Selective use of other data

In their desire to impress the nation with the severity of the problem, "Risk" writers were often highly selective in the data they chose and how they chose to interpret it. For example, they pointed to declines on the National Assessment of Educational progress (NAEP) science assessment for 17-year-olds. They omitted scores from 9- and 13-year-olds—which had only a slight decline, later recouped. They also ignored trends in reading and mathematics. These showed no sign of decline during the same period. It would be mind reading to guess why they did this, but the record should show that these other scores and trends do not support the crisis rhetoric of "A Nation At Risk."

The record should also show that the report's writers even cited some indicators of risk for which no data existed. They declared, for example, that the average achievement of students graduating from college had declined, and that 50 percent of gifted and talented students never achieved commensurate with their potential. Nowhere are there data that begin to address these two assertions. In fact, only now are some reformers calling for a national test for college graduates—a summons that would be humorous if it were not so serious. (The proposals are for a test that does not identify individuals or colleges. Eighth- and twelfth-graders do not take the existing NAEP very seriously. One can only imagine how college seniors would "blow off" an examination that has no personal impact.)

The Essence of Criticisms Past

As noted earlier, sounding an alarm for a failing U.S. educational system is hardly new. In 1883, one J.M. Rice looked at the public schools and found them lacking in supervision, awash with untrained teachers, and controlled by politically corrupt boards.[3] In the 1920s, the *American Educational Digest* carried a regular feature called, "Criticism of Education," which summarized and reprinted critiques found in the press around the country. It was riddled with comments about schools stifling thought, not teaching creativity, and failing to teach the "Three R's." At the same time, they were accused of adding frivolous electives, costing too much, trying to deal with "overloaded curricula," short-changing the gifted and talented, and lacking purpose. One article accused teachers of neglecting arithmetic because of the advent of "comptometers and calculating machines."[4]

The *Arkansas Democrat* did state that "efficiency experts" were trying to take the joy out of life when they called for the abolition of vacations; and

admitted to having "more than a slight suspicion that the experts aren't nearly so efficient themselves as they are trying to look as they hand out theories about how the world should be run."[5]

One New York City writer observed that when a city school burned, 500 pupils gathered nearby and danced with glee. His solution is quite contemporary: Make the schools more like businesses. "A manufacturer turning out poor material would lose his market, but the school goes on regardless of its output, without much attention from those who pay the bills."[6]

And while critics most often attacked elementary and secondary schools, higher education did not escape unscathed. College students were excoriated periodically for both their radicalism and their godlessness.

The last century has seen such constant carping about schools that in his book, *Public Education and Its Discontents*, educational historian Lawrence Cremin commented wryly, "Just about the time Adam first whispered to Eve that they were living in an age of transition, the Serpent doubtless issued the first complaint that academic standards were beginning to decline."[7] So frequent were the complaints and so common were their contents that one would have to conclude that educators are an unusually stupid, recalcitrant bunch—or, if you prefer, that the critics are off target.

Focus on national threat

The critics have waxed loudest when they have perceived some national threat that could possibly be averted by increases in education or in education's effectiveness, or both. The outcomes of World Wars I and II were determined by sheer force, of course, and the Great Depression reflected a worldwide economic collapse. Beating back the Red Menace, on the other hand, depended at least in part on education—or so many people thought.

After the Russians launched Sputnik, the first manmade satellite, in 1957, magazines fired off many articles critical of American schools. In March 1958, *Life* magazine featured an essay by Sloan Wilson, author of *The Man in the Gray Flannel Suit*, declaring schools operated a "carnival."[8] Wilson produced a litany of laments: the diploma had declined to meaninglessness; the rise of electives had swept out rigor; students no longer learned basic skills; textbooks had been watered down; intellectually gifted students were shunned by their peers. Except for a few giveaway names and terms that date the piece, Wilson's essay could be taken as a thoroughly modern critique.

Wilson's dirge was the opening of a strident four-part *Life* series compar-

ing U.S. schools with those in the Soviet Union. The series left no doubt: Without massive education reform in America, the Russians would, as Khruschev would soon say, bury us.

But *Life* magazine was hardly alone or extreme in its views. *Reader's Digest* declared, "We are offering them a slingshot education in a hydrogen bomb age."[9] Echoing Rudolph Flesch's popular 1957 tome, *Why Johnny Can't Read*,[10] Arthur Chase weighed in with a 1961 book: *What Ivan Knows That Johnny Doesn't*.[11] It was the first of many post-Flesch lumps that "Johnny" would take.

The educational reforms following Sputnik were not cast in terms of using the liberal arts to increase the quality of daily life, to improve the quality of society, or to increase our economic competitiveness with other nations—but rather to preserve the nation. The largest of the federal efforts was called simply, "The National *Defense* Education Act" (emphasis added).

Economic threat, the latest twist

Today, the perceived threats are not primarily ideological, political, or even military. They are economic and, again in the eyes of many, it is the schools that must rescue and preserve the union. The schools, of course, must themselves first be rescued.

During the last year of the Bush administration, both Bush and then-U.S. Secretary of Education Lamar Alexander said repeatedly, "For the nation to change, the schools must change." It began to sound like a mantra. Fortunately, the Clinton administration reversed the order of causality. In 1993, U.S. Secretary of Education Richard Riley said, "We can't get our education house in order until we get our economic house in order."

Indeed, we can, and should, ask why a system in which children spend only 9 percent of their lives between birth and age 18 must bear the burden of leading the nation forward. We can also ask how much the schools alone can accomplish without the assistance or support of the family and other social institutions.

Erroneous Assumptions, Beliefs Persist

As mentioned earlier, along with their desire to improve schools, many people hold a notion of a Golden Age of American schooling against which the current system compares badly. Such comparisons are wrong and even dangerous. As Lawrence Stedman of the State University of New York has written, "We

should all have serious doubts about a so-called Golden Age of education and be leery of looking back wistfully for solutions."[12] Nevertheless, many reform efforts have been predicated on the assumption that the typical school has failed, comparatively, and that the typical student knows less each year.

Syndicated *Washington Post* columnist Richard Cohen captured the sentiments of many when he wrote in August 1992 that, "During the Reagan-Bush years. . .the country got dumber on just about every achievement test the kids could take."[13] While it's true that scores on commercial, standardized achievement tests declined in the late 60s to the mid-70s, they later reversed direction and headed up again. By 1986, RAND researcher Daniel Koretz, then with the Congressional Budget Office, reported what the Bell Commission had overlooked:[14,15] Some scores were at 30-year highs. He also observed that it was hard to attribute either the decline or the later rise to what was happening in the schools. By the time Cohen penned his lines, some scores had risen to all-time highs.

A fair assessment?

Of course many hold, quite properly, that commercial achievement tests are not adequate tools for evaluating the quality of the system. A recent study commissioned by the National Science Foundation[16] analyzed such tests in mathematics and science and concluded that these tests are very well designed instruments that do not measure anything particularly important. Only a tiny fraction of the items cover high quality content or require higher order thinking, even at the high school levels. Nor do they adequately match the standards set by the math and science professional groups. Koretz himself later wrote that "simple aggregate [test] scores are not a sufficient basis for evaluating education."[17] Koretz correctly observes that we cannot link test scores directly to effective or ineffective instruction and that test scores are subject to the influences of many nonschool factors.

News media feed assumptions

Richard Cohen's comment reveals how deeply and tenaciously people hold the assumption of decline and how often this assumption turns up in media coverage of school performance. When Cohen wrote his column, he had known about rising test scores for almost two years.

Other journalists continue the distressing diatribe on the condition of education. For example, the November 1992 issue of the *American School Board*

Journal carried a story on the results of a 1992 international study of 31 nations. U.S. students tied for eighth overall. Yet the *Journal*'s headline stated "Good News: Our 9-Year-Olds Read Well. Bad News: Our 14-year-olds Don't." In a comparison of 31 nations, a 16th-place finish would be "average." How, then, can an eighth-place finish be "bad news?" (As you'll see in the next chapter, the reality was that the scores of the ninth place 14-year-olds were quite close to first place.) Another example: In September 1993, C. Boyden Gray and Evan J. Kemp declared, "Yet even America's best high school students, as international comparisons reveal, rank far behind students in countries challenging us in the multinational marketplace."[18] This is not true, as we'll also see in the next chapter, but it still is a commonly held belief.

Finally, an editorial in *USA Today* began with the contention that, "One report card after another flunks U.S. schools."[19] It then went on to approve of school management by profit-making companies, declaring that the situation was so bad that "if it takes something revolutionary [to improve schools], then let's do it."

Educators add to the problem

Such sentiments can be found even inside the education community. In June and July of 1993 for example, Albert Shanker, president of the American Federation of Teachers, began three consecutive Sunday *New York Times* columns as follows:

"The achievement of U.S. students in grades K-12 is very poor."

"American students are performing at much lower levels than students in other industrialized nations."

"International examinations designed to compare students from all over the world usually show American students at or near the bottom."

One can take issue with the first statement, and the remaining two are demonstrably false—although often made.

Thus, the real progress educators and students have made has been clouded by a fog of sometimes alarmist and oftentimes just faulty criticism. This is not to say that public schooling in America has reached its pinnacle and need not improve. But, before examining what the system needs in the way of change, we must first take a quick look at how the system is performing currently.

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CHAPTER TWO

THE REAL STATE OF THE SYSTEM

"A Nation At Risk" conjured up the specter of "a rising tide of mediocrity" that threatened our economic and social well-being. A flood of reports followed that document, all seeming to confirm the dour view and dire warnings.

But after the long night of the gloomy reports, a few researchers—sometimes at great risk to their reputations and their jobs—tried to assess the damage in a calmer fashion than the "Risk" authors.

In independent studies, Iris Rotberg,[1] Harold Hodgkinson,[2] Richard Jaeger,[3] Joseph Schneider and Paul Houston,[4] David Berliner,[5] the Sandia engineers,[6] and I all found: While there were indeed many problems calling—and sometimes screaming—for attention, the education system as a whole was functioning better than ever. Given the decay and decline in social institutions surrounding the schools, such performance seemed, at the very least, amazing.

Here are just some of the findings, based on data from 1990 to 1993:

- **High school completion rates are high** — about 86 percent.[7]
- **Conversely, dropout rates are low** and have been declining over the last 20 years for all groups except Hispanics, who have the highest dropout rate and a stable one.[8]
- **College attendance has increased** by 4 million to a record level of 15 million—despite a steady decline in the number of high school seniors since 1977. About 58 percent of high school graduates now attend college, and another 10 percent enroll in some type of postsecondary technical or vocational school. Major demographic changes in the college population have transpired, but often have gone largely overlooked: The average undergraduate is almost 25 years old, and only 62 percent of undergrads attend school full-time; minorities represent 30 percent of students taking the SAT.[9]

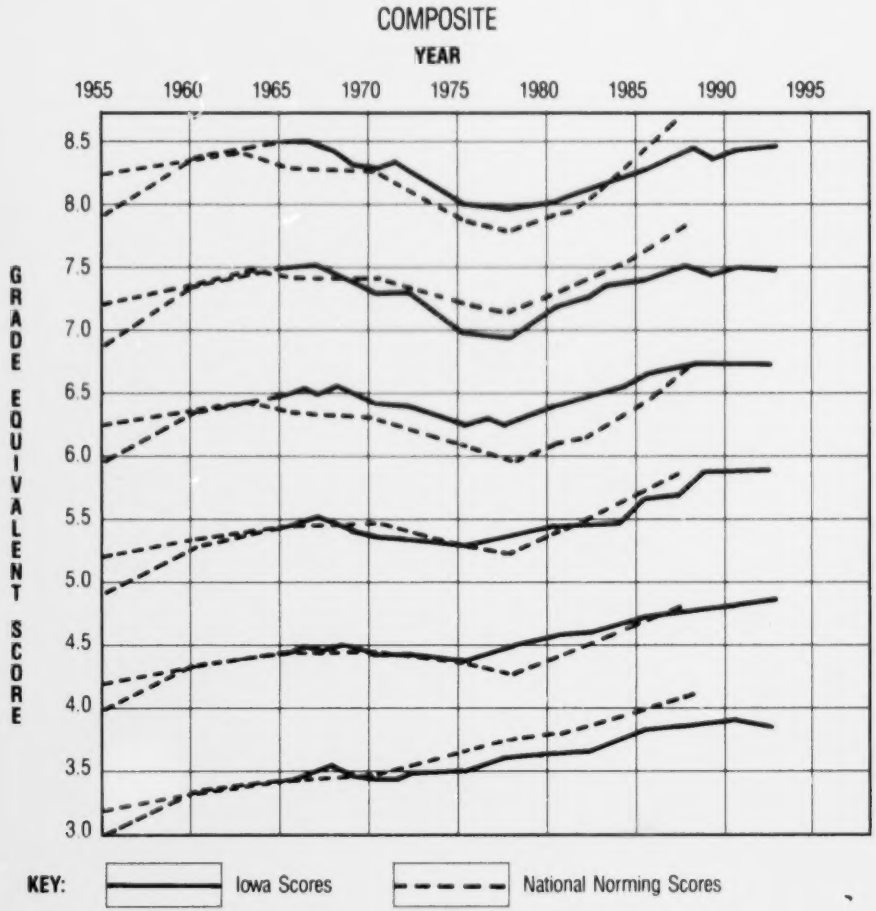
These statistics on high school completion and college attendance would be of little interest if schools were doling out meaningless diplomas on the basis of "seat time" or "social promotion," as some critics have claimed. But this is not what's happening.

- **Achievement test scores are up.** Some are at all-time highs (see Figure 2-A). Some of the rise can be attributed to increased attention to test scores by policy makers, the press, and the public. They have put a premium

FIGURE 2-A

Achievement Scores On the Rise

Some achievement test scores are at all-time highs. The solid lines are trends for the Iowa Test of Basic Skills. The broken lines are trends for national norming studies of the ITBS. Note that in several instances, national trend lines are above those for Iowa.



Source: H.D. Hoover, Iowa Testing Programs, University of Iowa

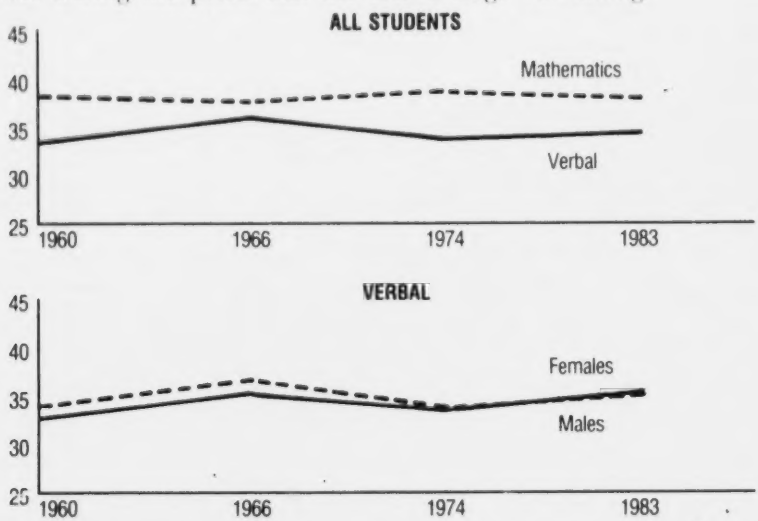
on high test scores, which, on occasion, has resulted in inappropriate attention to such scores. But some of the increase appears to reflect real achievement.[10,11]

- **SAT scores for all ethnic groups except whites have risen** since the College Board began keeping data by ethnicity in 1975. As noted earlier, the aggregate average is more complex than it first seems. The overall SAT average looks as if it is falling, but this is an illusion. It's an event so common in mathematics that it has a name: Simpson's Paradox. Minority groups' scores have been rising, but their average scores still lag well behind those of whites. The percent of minorities in the test-taking group has risen from about 8 percent in the mid-60s to 30 percent in 1993. Adding this increased number of low but improving scores into the mix lowers the average. (The arithmetic of Simpson's paradox is simple and is illustrated as Figure 2-J at the end of this chapter.)

FIGURE 2-B

Trends in PSAT Norming Study Results

While the SAT had a long period of decline, the average SAT score is determined by whoever shows up on Saturday mornings to take the test. National norming studies of the PSAT, a short version of the SAT, show no declines during the priod that the SAT average was falling.



Source: Educational Testing Service Policy Center, Princeton, N.J.

- **Scores on Advanced Placement tests have been stable**, but the number of AP test-takers rose from 98,000 in 1978 to 413,939 in 1993. With such a deeper dig into the talent pool, one might well have expected scores to fall,[12] but the decline has been small, from 3.16 to 3.00 on a five-point scale.
- **The percentage of graduates taking the College Board achievement test has been stable**, and their scores are up over the last decade, as are their SAT scores.[13]
- At the university level, **the number of students taking the Graduate Record Examination has increased in the last decade.** Yet scores have risen on all three tests—verbal, mathematical, and analytical.[14]
- **Scores on the National Assessment of Educational Progress (NAEP) reading, mathematics, and science tests are as good as or slightly better** than their level at NAEP's inception in 1969—except for the scores of 17-year-olds in science. The science scores of 17-year-olds have recovered more than half of the initial loss.[15]
- **Students know at least as much as their parents knew.** In their study of students' knowledge of American history and literature, Diane Ravitch and Chester Finn awarded "F's" to 17-year-olds in both subjects.[16] However, Ravitch and Finn chose items that 50 percent of students fail on average. Then they set their pass-fail cut at 60 percent correct, thereby guaranteeing a high failure rate. A more recent study by Dale Whittington of the University of Akron found that today's students know at least as much as their parents and grandparents and, given the increased high school completion rates today, probably more. In previous generations, those who knew less might well have dropped out of school by age 17.[17] Further, a review of "then-and-now" studies of reading reported in *Literacy in America* found no evidence of better reading performance at any time in the past.[18]
- **American 9-year-olds finished second** in a 1992 study of reading involving 200,000 students in 31 countries. American 14-year-olds tied for eighth, and very close to first place.[19] The difference between the eighth-place American students (535) and the second-place French (549), for example, is only 14 points on a 600-point scale identical to that of the SAT. This difference is the same as the difference between 535 and 549 on the SAT verbal (see Figure 2-C).

Ranks, however, are deceptive. They obscure performance: When people, states, or nations are ranked, someone *must* rank last. Even in the Olympic

FIGURE 2-C

Second By a Nose

A 1992 study of students in 31 nations found American 9-year-olds* second in the world in reading. American 14-year-olds finished ninth, in the top third, but with scores only three points farther out of first place than the 9-year-olds. The scores of 14-year-olds were tightly bunched together, meaning that a difference of a few points made a big difference in ranking.

Scores for 9-year-olds

Country/ Region	Grade Tested	Mean Age (in years)	Overall Mean (s.e.)	Overall SD
Finland	3	9.7	569 (3.4)	70
United States	4	10.0	547 (2.8)	74
Sweden	3	9.8	539 (2.8)	94
France	4	10.1	531 (4.0)	74
Italy	4	9.9	529 (4.3)	80
New Zealand	5	10.0	528 (3.3)	86
Norway	3	9.8	524 (2.6)	91
Iceland	3	9.8	518 (0.0)	85
Hong Kong	4	10.0	517 (3.9)	71
Singapore	3	9.3	515 (1.0)	72
Switzerland	3	9.7	511 (2.7)	83
Ireland	4	9.3	509 (3.6)	79
Belgium/Fr	4	9.8	507 (3.2)	77
Greece	4	9.3	504 (3.7)	75
Spain	4	10.0	504 (2.5)	78
Germany/W	3	9.4	503 (3.0)	84
Canada/BC	3	8.9	500 (3.0)	80
Germany/E	3	9.5	499 (4.3)	84
Hungary	3	9.3	499 (3.1)	78
Slovenia	3	9.7	498 (2.6)	78
Netherlands	3	9.2	485 (3.6)	73
Cyprus	4	9.8	481 (2.3)	77
Portugal	4	10.4	478 (3.6)	74
Denmark	3	9.8	475 (3.5)	111
Trinidad/Tobago	4	9.6	451 (3.4)	79
Indonesia	4	10.8	394 (3.0)	59
Venezuela	4	10.1	383 (3.4)	74

Scores for 14-year-olds

Country	Grade Tested	Mean Age (in years)	Overall Mean (s.e.)	Overall SD
Finland	8	14.7	560 (2.5)	65
France	9	15.4	549 (4.3)	68
Sweden	8	14.8	546 (2.5)	80
New Zealand	10	15.0	545 (5.6)	92
Hungary	8	14.1	536 (3.3)	73
Iceland	8	14.8	536 (0.0)	78
Switzerland	8	14.9	536 (3.2)	74
Hong Kong	9	15.2	535 (3.7)	64
United States	9	15.0	535 (4.8)	85
Singapore	8	14.4	534 (1.1)	66
Slovenia	8	14.7	532 (2.3)	63
Germany/E	8	14.4	526 (3.5)	73
Denmark	8	14.8	525 (2.1)	77
Portugal	9	15.6	523 (3.1)	60
Canada/BC	8	13.9	522 (3.0)	81
Germany/W	8	14.6	522 (4.4)	78
Norway	8	14.8	516 (2.3)	71
Italy	8	14.1	515 (3.4)	73
Netherlands	8	14.3	514 (4.9)	76
Ireland	9	14.5	511 (5.2)	81
Greece	9	14.4	509 (2.9)	65
Cyprus	9	14.8	497 (2.2)	73
Spain	8	14.2	490 (2.5)	65
Belgium/Fr	8	14.3	481 (4.9)	78
Trinidad/Tabago	9	14.4	479 (1.7)	87
Thailand	9	15.2	477 (6.2)	79
Philippines	8	14.5	430 (3.9)	65
Venezuela	9	15.5	417 (3.1)	61
Nigeria	9	15.3	401 (- -)	65
Zimbabwe	9	15.5	372 (3.8)	60
Botswana	9	14.7	330 (2.0)	43

* Ages actually ranged from 8 to 10, and from 14 to 15 respectively. Ages 9 and 14 are given as averages.

Source: The International Association for the Evaluation of Educational Achievement, July 1992.

100-meter dash, someone ranks last, although his peers likely do not call him "Pokey." If one looks at actual scores, the American 14-year-olds actually do almost as well as American 9-year-olds. American 9-year-olds finish 22 points behind the first place Finns (569 vs. 547), American 14-year-olds, 25 points back (560 vs. 535).

- **Students do not trail "far behind" students of other nations**, as critics often allege. In the Second International Assessment of Educational Progress (IAEP) in mathematics and science, American 9-year-olds finished third among students in 15 nations. In the other comparisons, American students did not rank high. But when one examines the actual scores, all four averages hover right at the international averages.

The overall rankings and scores, however, are misleading. For example, of one disaggregates the data by ethnicity, a far different picture gets painted. Here is the top of the scale:

Category	Score
Asian students, U.S. schools	287
Taiwan	285
Korea	283
Advantaged urban students, U.S. schools	283
White students, U.S. schools	277
Hungary	277

Since Asian and white students make up about 70 percent of U.S. students, it can be seen that the great majority of American students are competing well with students in the top foreign countries. Some students, however, are not faring as well in the competition. At the bottom of the scale we find this:

Mississippi	246
Jordan	246
Hispanic students, U.S. schools	245
Disadvantaged urban students, U.S. schools	239
Black students, U.S. schools	236

Obviously, we have a big job to do with our lowest achieving groups.

- **America's "best" students outperform those of other developed nations.** Analyses of the Second International Mathematics Study (SIMS) reveal that when American students are compared to Japanese students on mathematics that both have actually studied, American students outscore the Japanese substantially.[20] (See figure 2-D) That analysis compared 20

FIGURE 2-D

United States and Japan: Top Students Compare Favorably

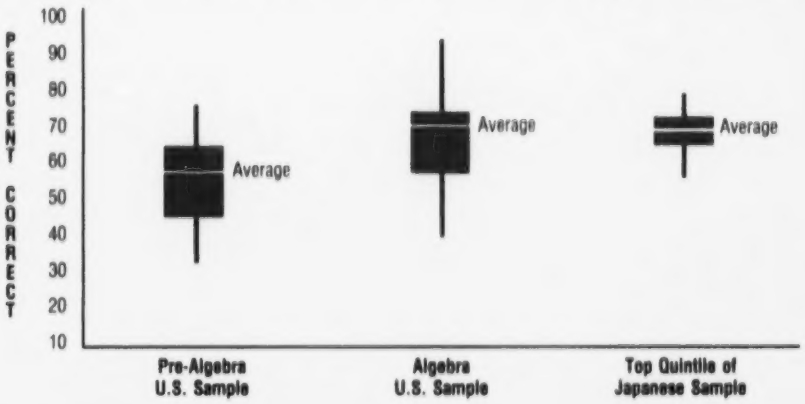
American eighth-graders actually taking algebra compare favorably to either the entire class of Japanese eighth-graders or the top 20 percent of Japanese eighth-graders. The very best of American students score much better than the very best of the Japanese top 20 percent while the lowest performing Americans are much worse than their Japanese counterparts.

		ARITHMETIC			ALGEBRA		
Country and course type		***N***	**Mean *p* values**	***SD***	***N***	**Mean *p* values**	***SD***
				TOP HALF OF CLASSES			
United States:	All classes	136	66	9	136	57	12
	Remedial	4	61	4	4	47	8
	Typical	65	60	7	61	50	7
	Enriched	35	67	9	35	59	8
	Algebra	32	76	7	36	69	12
Japan		105	66	5	105	65	4
				BOTTOM HALF OF CLASSES			
United States:	All Classes	137	37	9	137	28	7
	Remedial	26	28	7	26	22	5
	Typical	101	39	7	105	30	6
	Enriched	4	37	10	4	27	7
	Algebra	6	42	11	2	24	6
Japan		106	55	5	106	55	4

KEY: N = Number Sampled P = Percent Correct Responses SD = Standard Deviation

Source: Westbury, *Educational Researcher*, June-July 1992

Box-plots displaying ranges of American pre-algebra and algebra achievement and the range of achievement of the top quintile of the Japanese sample.



percent of American eighth-graders (presumably the academically most able 20 percent) to 100 percent of Japanese eighth-graders. A second analysis examined the relative scores of the American students with the top 20 percent of Japanese students—the American students still scored higher, although the difference was quite small. However, within this select 20 percent, the top 5 percent of American students scored well above the top 5 percent of Japanese students.

- **Students in the top 50 percent of American classes scored as well** or better than Japanese students in the top half of Japanese classes on SIMS mathematics tests.[21] However, while Japanese students in the lower half of Japanese classes do not trail their upper 50 percent peers by too much, American students in the lower half of American classes score much worse than their Japanese counterparts and much worse than American students in the top 50 percent of American classes. (Again, the dreary performance of American students in the lower echelons of achievement is an important consideration for reform. It's a threat to their well-being and the nation's, and will be discussed at length later.)

Similarly, an examination of scores on the second IAEP shows almost all countries tightly bunched together at the upper levels of performance.[22,23] The differences in scores are so small that ranks distort and exaggerate the differences among nations. For example, the top 5 percent of Korean 13-year-olds, who had the highest average score, scored 96 on the science test. The top 5 percent of American students, who ranked a mere thirteenth, scored 92. Because the countries are close together in terms of scores, a few points difference in scores makes a large difference in *ranks*. But the score differentials are hardly sufficient to create a crisis of confidence in our educational system.

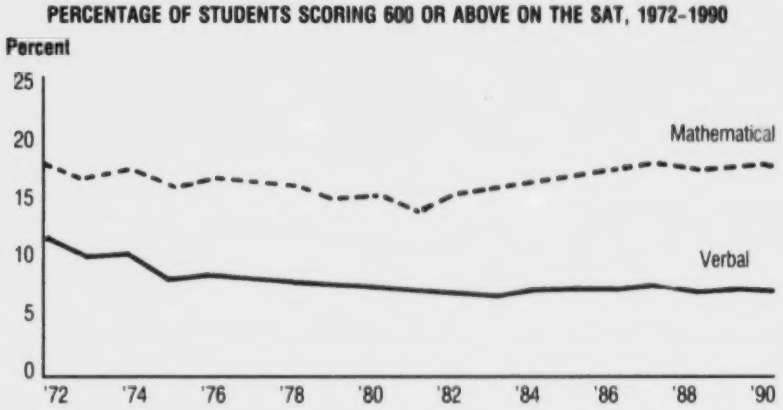
- **The number and proportion of students scoring above 650** on the verbal or mathematics section of the SAT has not declined in the last decade, as the nation's "Education Newspaper of Record," *Education Week* declared in 1993.[24] (See Figure 2-E.) The number and proportion on the verbal section are both the same over the last 10 years, and both the number and proportion of high scorers on the mathematics section have risen.

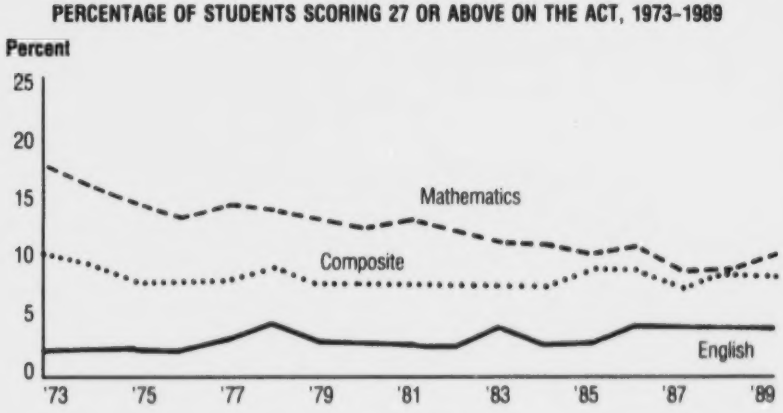
Eleven percent of current test takers score 650 or better on the SAT mathematics section, up from 7 percent a decade ago. Given that statisticians forced a normal curve on SAT scores when the standards were set in 1941, this represents a large increase. (It is in the nature of normal curves that not many people score at the extremes.) On the SAT, 650 is one and one-half

FIGURE 2-E

High Performers' Scores Misreported

Although *Education Week* reported that "in the last decade, both the number and proportion of students scoring above 650 on the SAT verbal or mathematics has declined," the number on both tests has increased. The proportion has increased enormously on the SAT math. *Education Week* inadvertently reported only the scores for students scoring between 650 and 690, omitting all those who scored between 700 and 800, the highest possible score.





Source: *Performance at the Top*, 1991.

standard deviations above the mean. When the standards were set, using an almost all-male, almost all-white elite in the Northeast, only 6.63 percent of them topped the 650 mark. From 1992 to 1993, the number of students scoring above 650 rose by 2,300 on the SAT verbal and 5,600 on the SAT mathematics. The total number of test-takers rose by 10,000. The increases in high scorers are thus disproportionately large compared to the increases overall. For the mathematics section, the percent of students scoring above 650 is at an all-time high.

High scoring Asian immigrants cannot account for the increase in the number of high scorers. Although Asians do, indeed, score much higher than other ethnic groups in mathematics (but not in verbal), they represent only 8 percent of all test-takers — far too small a number to produce the change. The results from 1993 show over 110,000 students with an SAT mathematics of 650 or better, and only 83,000 Asians in the entire sample of just over 1,044,000 students.

- **The longstanding prediction of a shortage of scientists has never developed**, nor will it. The prediction was based on faulty assumptions. It is now seen in some quarters as a cynical ploy to get more federal funds directed to science. We have, in fact, a surplus of scientists. This surplus is likely to grow as the defense establishment shrinks. (One-third of American scientists and engineers currently work for the Pentagon.) As it is, *The New York Times* reported in 1992 that 12 percent of those receiving doctorates in physics in 1991 received zero job offers.[25] Another 50 percent received only one.

"Perspectives on Education in America," the Sandia Report, found Americans obtaining technical and scientific degrees at record rates, even taking into account the percentage of those degrees going to persons from other nations (many of whom remain here, adding a significant amount of intellectual capital to this country).[26]

- **The United States already is either number one in math and science**—as called for in the National Education Goals—or is very close. Of course, this is true only if you define number one in terms other than within the narrow confines of multiple choice test scores.

For example, the United States has more engineers per 10,000 workers (184) than any other nation except Japan (188). The former West Germany has 182, and then the numbers drop off quite sharply for other developed nations.[27] Similarly, scientists, engineers, and mathematicians in the United

States account for about 27 percent of all publications in research journals.[28] This is more than triple the percent of the three second-place finishers—Japan, the United Kingdom, and the former Soviet Union. These numbers have been stable since at least 1973.

Achievement Up Despite Social Decline

As noted earlier in this chapter, the accomplishments cited are even more remarkable when put in the context of a declining social fabric. The decline can be seen in a variety of statistics:

- **Some 20 percent of American children live in poverty**, even after social programs are taken into account. This compares to 9 percent in Canada, 8 percent in the United Kingdom, 5 percent in France and 3 percent in the former West Germany.[29] (See Figure 2-F.) Children who live in poverty do not perform well, even if they get good grades in school. Students in low poverty schools who get A's score at the 87th percentile on a standardized test. Students in high poverty schools who get A's score at the 36th percentile. Students in high poverty schools who get A's do not score as well as students in low poverty schools who get C's.[30] (See Figure 2-G.) (In this study, a high poverty school was defined as one with 76 percent or more students eligible for free and reduced lunch. Low poverty schools had a 0-20 percent eligibility.)

Poverty's impact on education surpasses that of ethnicity. An analysis of math test scores by ethnicity and socioeconomic status shows the usual trends for different groups with blacks scoring lowest, then Hispanics, whites, and Asians. But looking at the top and bottom 25 percent in terms of socioeconomic status, poor Asians do not do as well as wealthy blacks.

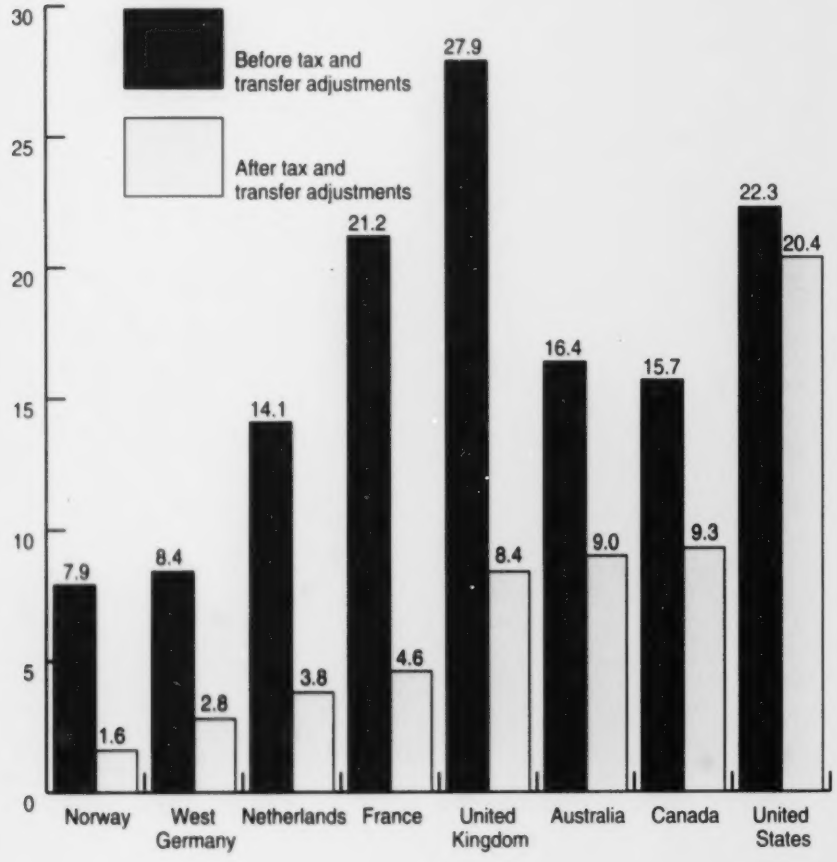
It should also be noted that poverty affects more than test scores. Although students who drop out of school give a variety of reasons, poverty is a common one.

- **Fewer than 50 percent of U.S. children receive the immunizations they need** to ensure their early years are free of common childhood diseases. Five percent of these children were born with preventable handicaps (In Europe, percentages range from 80 to 95 percent.).[31]
- **The United States ranks nineteenth in the world for both infant mortality and low birth weight deliveries.**[32] Low birth weight children are much more likely to repeat a grade, fail in school, or end up in special education

FIGURE 2-F

Percentage of Children Living in Poverty in Industrialized Nations: 1991

The United States has more than twice as many children living in poverty as other developed nations. While the United Kingdom has a greater proportion (using only raw numbers), once welfare programs are taken into account, the proportion there falls to less than half that of the United States.



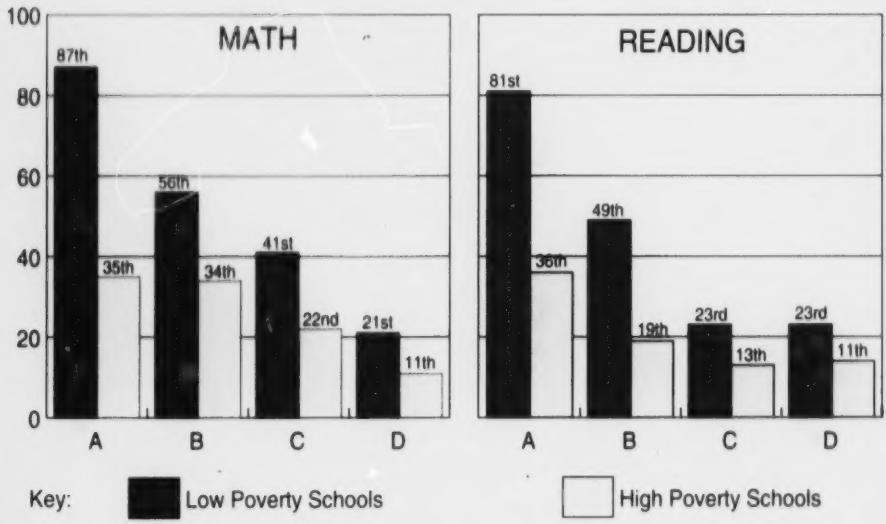
Source: *Education Week*, September 29, 1993

FIGURE 2-G

Poverty and Performance

Letter grades in high poverty schools may mask low achievement. Students who receive A's in mathematics in high poverty schools do not score as well as students who receive C's in low poverty schools. High poverty schools in this instance are defined as schools with at least 76 percent of students eligible for free- and reduced-price lunch. Low poverty schools have 0–20 percent eligibility.

7th-Graders' Percentile Test Scores by Course Grades; Low and High Poverty Schools, 1991



Source: Prospects (Abt Associates, 1993); *Education Week*, June 9, 1993.

than are normal birth weight children. The lower the weight, the greater the risk.

- **A rising proportion of children live with one parent.** While the effects of single parenting are complex, we know that test scores correlate with the percent of children living with a single parent: the higher the percentage, the lower the scores.[33]
- **Crime is posing a bigger threat.** Stories concerning children bringing guns to school—and sometimes using them—are on the increase. The cover of a September 1993 issue of the *New Yorker* presented a chilling impression of children arriving for the first day of school. Each carried a lunch box and an assault rifle.

Sadly, the fastest growing segment of the population is the incarcerated. Despite increasing numbers of early releases and the use of electronic trackers to keep surveillance on prisoners out of jail, the prison population of Maryland increased 250 percent between 1980 and 1992, for example. There is no indication that Maryland's statistics are anomalous among states.[34]

U.S. Index of Social Health at all-time low

The Index of Social Health, sometimes referred to as the "Dow Jones of the Soul," permits us to see these trends in a single figure. Published annually by the Institute for Innovation in Social Policy at Fordham University, the Index combines 17 social indicators such as infant mortality rate, poverty rate, food stamp rate, and homicide rate into a single number that takes on values between 0 and 100.[35] The Index peaked at 72 in 1977, then plummeted to an all-time low of 30 in 1990, the last year for which numbers are available. The index contains only one education indicator, the dropout rate. During the period mentioned, this rate has been stable or improving. The schools are not dragging the Index down (see Figure 2-H).

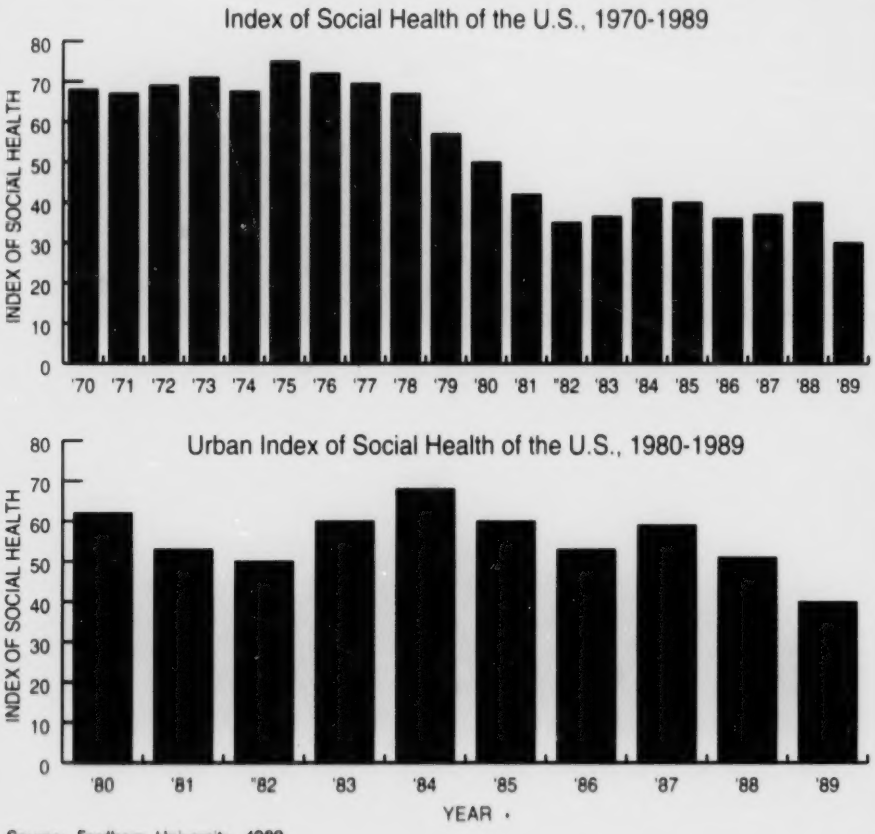
Objective, Systemic Approach Needed

The statistics presented in this chapter lead to the conclusion that previous examinations of schools, especially "A Nation At Risk," have failed to take into account many of the subtleties in the data. It also reveals that the social context in which schools function is declining, something also omitted in "Risk" and many other analyses. To obtain a clear idea of what needs to be done and how requires a comprehensive approach to examining both

FIGURE 2-H

Index of Social Health of the U.S., 1970–1989

Fordham University's Index of Social Health has shown a steady decline since 1976. The Index combines rates for infant mortality, child abuse, children in poverty, teen suicide, drug abuse, high school dropouts, unemployment, poverty among heads of household, health insurance gaps, unemployment insurance gaps, poverty of people over 65, out-of-pocket health costs for people over 65, homicide, highway deaths due to alcoholism, food stamp gaps, gaps between rich and poor, and lack of affordable housing into a single index that can vary from 0 to 100. The dropout rate, the only education indicator in the Index, has been improving during the period the Index has been published.



Source: Fordham University, 1989.

schools and the institutions surrounding and affecting them. Only such a comprehensive, systems approach can be expected to accomplish what needs to be done.

Keep outlook positive

In taking a systemic view, perhaps the first step for school leaders is to recognize and refute the pervasive mind-set of school failure. The assumption of school failure leads people to accept data corroborating the failure uncritically, and to ignore or distort information such as that presented in this chapter. Just one example: In 1993, Harvard professor Katherine Merseth declared that:

> Effort receives little credit for contributing to successful learning in mathematics—or, for that matter, in any subject. For example, American, Japanese, and Chinese mothers were asked what factors among ability, effort, task difficulty, and luck made their children successful in school. American mothers ranked ability the highest, while Asian mothers gave high marks to effort.[36]

Merseth's statement is false, but it is widely believed. Merseth is only one of many people who have mouthed this apparent verity, and she is quoted only because her citation is convenient—not because it is unusual. Harold Stevenson, who produced the data that Merseth was working from, has perpetrated this untruth in many articles. Merseth simply accepted what Stevenson said without looking carefully enough at the graphs.

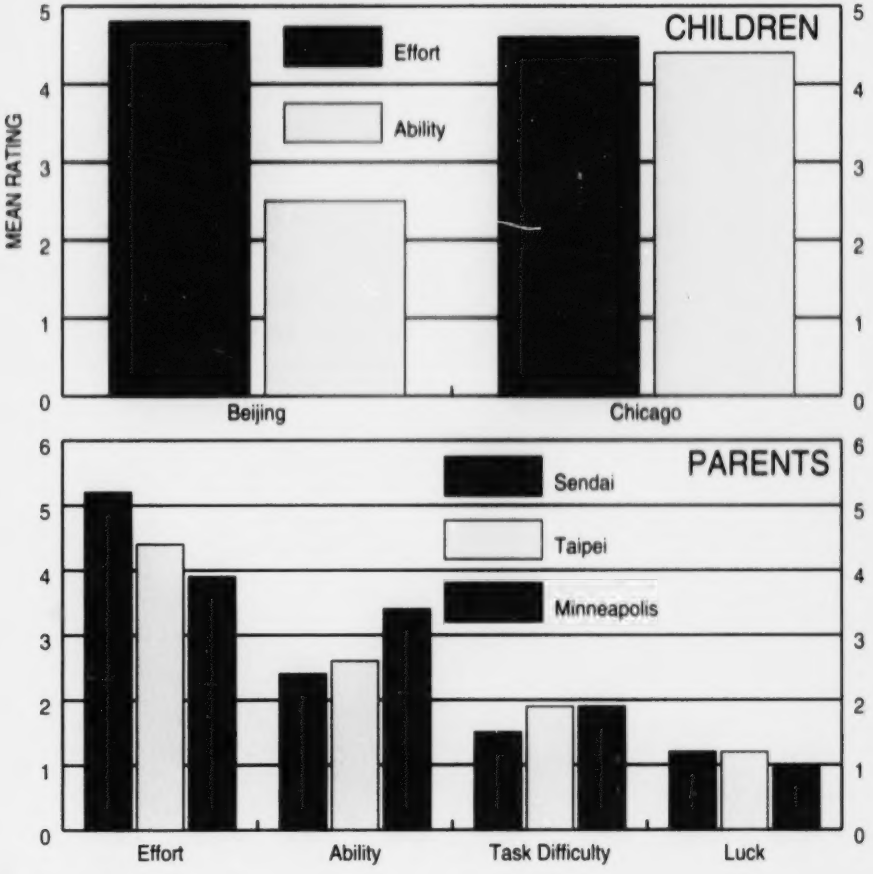
In fact, *Stevenson's own data* show that it is not true.[37] It is true that American mothers rank ability as more important than Asian mothers do. But it is also true that American mothers rank effort as more important than ability (see Figure 2-I). They believe it is almost as important as Asian mothers do. American children show the same pattern: They give more importance to ability than Asian kids, but rank effort as more important than ability and almost as important as Asian children rank it.

Since good data drive systemic management and change, we must encourage very close, objective examinations of any and all reports on the performance of American students. With solid knowledge of how the system performs, we can start to examine the nature of the system and its needs. First however, we need to describe why a systems approach is needed.

FIGURE 2-I

Effort Is Important

From the work of Harold Stevenson and colleagues, many people have concluded that American students and their mothers believe that good school performance comes from ability, while Asian students and their mothers believe it comes from effort. A close look at the graphs from *The Learning Gap* shows that this is not true. American students and mothers both rate effort as more important than ability. And, they value effort almost as highly as do Asian mothers and their children.



Source: *The Learning Gap*, 1992

FIGURE 2-J

The Arithmetic of Simpson's Paradox

	Column A	Column B
1.	500	510
2.	500	510
3.	500	510
4.	500	510
5.	500	510
6.	500	510
7.	500	510
8.	500	430
9.	500	430
10.	400	430
Total:	4900	4860
Average:	490	486

These two columns of numbers represent SAT scores for purposes of explanation. (See p. 11 of this book.) Assume that column A represents the SAT scores for test takers in one year. Assume further that the 500's all come from one ethnic group and the 400 from another. The overall average is 490 ($(9 \times 500) + 1 \times 400)/10$. Assume that Column B represents the SAT scores of the same two ethnic groups some years later. The scores of the first have risen from 500 to 510 and the scores of the second from 400 to 430. However, whereas the second ethnic group constitutes 10% of the test takers in Column A, in Column B the second ethnic group represents 30% of the test takers. Their scores, while rising faster than those of the first ethnic group, remain below those of that first group. Thus, adding more diversity into the overall average lowers it from 490 in Column A to 486 in Column B. This is essentially what has happened to SAT scores and ethnic composition since 1975.

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CHAPTER THREE

THE NEED FOR A SYSTEMS APPROACH

For a complete understanding of American education—and certainly before one passes judgment on it—one needs to examine the entire system from pre-kindergarten to post-graduate school. Only such a view presents the entire picture.

Without a view of the whole system, policies and programs may well turn out to be misdirected or produce unforeseen effects. As we have learned from the science of ecology: A stress in one part of the system often produces results in another part of the system—results that can surprise unless the system is well understood. The emerging science of chaos uses a telling analogy about the interdependence of events in a system known as "the butterfly effect": A butterfly fluttering over Tokyo affects the weather in New York.[1]

Systems Thinking Not the Norm

Many Americans are not used to thinking in systems terms. Our intellectual tradition is one of analysis, of breaking things apart into component elements. Our heritage from both the British Empiricist philosophers and from American experimental psychology—monopolized until recently by atomistic behaviorism—emphasizes breaking complex matters into simple parts. In recent years, education has been strongly influenced, perhaps dominated, by a back-to-basics approach that views complex skills merely as accretions of simple skills. While Bloom's hierarchy places synthesis beyond analysis, analysis pervades our approach to most issues and topics. (Has anyone ever heard of a television commentator referred to as a "news synthesist?")

As a consequence of these twin legacies from philosophy and psychology, most education writers and reformers have not taken such a systems view. Most commentaries have not only limited their range to the K-12 component of the system, they have focused narrowly on only a few of the grades within that component. Most international comparisons, for example, have procured data only from grades 4 and 8. This is an understandable approach because in many countries a substantial portion of the population leaves school after the eighth grade, or the system becomes rigidly tracked and provides different groups with noncomparable instruction.

Studies that have tried to examine performance in the twelfth grade have

been fatally flawed. This is so not only because of the stark differences in percentage of students in school, but also because of the even starker differing percentages of students in various kinds of courses. For example, the Second International Mathematics Study found Hong Kong students in the middle of the pack in eighth grade and nearly number one by grade 12. By contrast, students in Hungary were number one in the eighth grade, and had fallen to below average. These data could reflect that Hong Kong's secondary schools are the best in the world and that Hungary's system slips badly after middle school. It is more likely, however, that the numbers turn out the way they did because only 3 percent of Hong Kong's students were in mathematics at grade twelve, while nearly 50 percent of Hungary's students were. Accomplishment in mathematics is a source of national pride in Hungary and it keeps many more students in math programs longer than in other nations.

As an aside, virtually no one in the United States attempts to test seniors—apparently for good reason. Those that have tried have found answer sheets blank or filled in with designs. It appears that those working on the New Standards project and others interested in assessing educational outcomes are unaware of this foible of American students. Harold Stevenson and James Stigler's book, *The Learning Gap*, is just one example of prominent U.S. Studies being piecemeal. The cover of the book reads, in its entirety, "Why Our Schools Are Failing and What We Can Learn from Japanese and Chinese Education."[2] One would expect (or hope), then, that the authors had looked at the entire system. But *The Learning Gap* contains achievement data from studies looking at test scores mostly in mathematics and only in grades 1 and 5! It also is important to note that these studies suffer methodological, sampling, and cultural flaws which render them essentially meaningless.

Why a Systems Approach Is Needed

As indicated by the discussion in chapter 2 on the Index of Social Health, the educational system is part of a larger social system. It cannot be understood apart from that larger system, which is sometimes considered the *context* of the educational system.

Some have argued that this larger system should be ignored, that educators should simply take responsibility for what they have in their purview. To consider the social context, they claim, is to make excuses for education's poor performance and low productivity. Would that it were this simple.

Focusing on the larger system and its context, indeed, risks missing some problems. It is the risk illustrated by the old story warning about the dangers in the use of local norms: A middle-aged man enters a doctor's office and says, "Doc, I'm only sleeping two hours a night. Am I normal?" Before answering, the doctor asks for more information. The man reveals he sips vodka all day and chugs a half pint of Scotch whiskey before going to bed. He's just been fired and his wife has left him. Finally the doctor answers, "Yes, for a 50-year-old jobless alcoholic going through a divorce, you're normal." Similarly, some school systems with problems camouflage or ignore them by comparing themselves, on test scores, say, with similar systems.

Currently, there is talk of "adjusting" NAEP state scores to compensate for differences in parental education levels, ethnicity mixes, poverty, etc. While this sounds reasonable, it presents the same problem as the 50-year-old alcoholic: States that don't have a student body representative of the nation as a whole have to face that fact. Indeed, a recent report from the Educational Research Service finds that 89 percent of the variability in state-level NAEP mathematics scores is accounted for by parental education, number of parents at home, community type and state poverty rates for ages 5-17. The authors argue that in the face of this, NAEP state scores are a good index of the difficulty of the educational task facing those states.

Analyses made in a vacuum often are incorrect

On the other hand, to examine only the school system without its context is similar to trying to judge the performance of an air-driven engine in a vacuum. It leads to incomplete or erroneous analyses and prescriptions. For example, Denis Doyle of the Hudson Institute alleges that the United States has a productivity crisis in education: Funding for education in real dollars rose 34 percent between 1982 and 1992, but test scores for that period were stagnant.[3] Challenged on the stationary nature of test scores, Doyle said that the "important" scores, those on the SAT, were flat. The link between expenditures and changes in test scores, especially changes in the SAT, is indirect, but the example indicates the problems inherent in not taking the broad view.

To shift from a mechanical metaphor of the engine to a more appropriate biological analogy, the schools and the social institutions surrounding them really make up only one ecosystem in the long run. We need to know how the environment of the schools affects schools. About three years ago, *Harper's* editor Lewis Lapham reflected this sentiment when he wondered how on

earth we could expect the schools to promote values and activities that were rarely found in the rest of society: "Children learn by example as well as by precept, and they have only to look at Times Square and Disneyland—or to consider the triumphs of individuals as culturally bereft as [former] President George Bush, Madonna, Bob Hope, and Donald Trump—to know that as a nation we care as little about the arts and humanities as we care about the color of the rain in Tashkent."[4] As the title of Harold Hodgkinson's 1985 publication attests, ultimately it is *all one system.*[5]

"Quick fixes" can cause even more problems

As noted, the discipline of ecology suggests that one tinkers with a part of a system in isolation at one's peril. The ecological perspective—that a change in the system at one point has ramifications, sometimes hard-to-predict ramifications, at other, distant points in the system—should have taught us to move slowly and systematically.

The ecological perspective, however, clashes against two strongly ingrained American solution tendencies: toward the short-term, quick fix and toward a one-problem, one-solution approach to problem solving. Research shows that school children learn to look for the solution to any problem. In science, laboratory "experiments" often guide them directly to the solution and offer no challenge to their reasoning or problem-solving capabilities. In math, they learn that any problem can be solved in five minutes because that's all the teacher gives them.[6,7] In fact, many real-world problems have multiple solutions that may be equally efficacious.

These flaws in the typical American approach to solving social problems are compounded by the tendency to make what sociologist Philip Slater termed "the toilet assumption."[8] Once we flush the toilet, we think we're done with the problem. We have no conscious thought that it still exists somewhere else in the system. Lacking a systems perspective, we are surprised and angry when, on occasion, it backs up. Having "solved" a problem, we feel, wrongly, that we need not attend to it further.

Nonsystemic reform doesn't yield desired results

Similarly, much reform, even well-intended reform, has failed to produce the intended outcomes because it has focused only on one group of students or one program. Chapter 1, Head Start, PL-94.142, all addressed worthy goals. But the problem with, say, Head Start, is that for many children it comes

after five years of Bad Start. Ernest Boyer in *Ready To Learn*,[9] does trace readiness problems back as far as the mother's pregnancy. But his is a work directed to one element, the first National Education Goal, and is not a complete systems approach. Somewhere this effort must be coupled with components of the program that precede and follow the activities and ages addressed by Boyer. We must ask why is it that children are entering school today less ready to learn, and *what* can we do about it?

The Key School. What has happened with the Key School in Indianapolis is a good example of the results of nonsystemic reform. A group of teachers, charged with developing a curriculum for gifted and talented elementary students, concluded that a curriculum based on Howard Gardner's theories of multiple intelligence in *Frames of Mind*[10] would form an appropriate curriculum for all children. Unable to persuade the other teachers to their view, these teachers eventually established a new school known as the Key School, a magnet school within the Indianapolis Public Schools with an ethnic mix identical to that of the whole system.

In the five years of Key School's existence, it has drawn perhaps the most ardent and sustained positive attention from the media and from educators around the country of any school in the nation. (As discussed later, however, little interest has been shown about it in Indianapolis—another aspect of the system that needs attention. Elsewhere I have labeled this aspect, "the pathology of envy.")[11]

While the Key School attempts to teach to each child's strengths and weaknesses, all children learn a foreign language and all learn to play a musical instrument. All children take fine arts daily. Teachers teach, in part, about things that interest them in the outside world on the (accurate) assumption that topics that genuinely interest teachers also will interest the children. The curriculum isn't organized around the usual discrete topics, but around large themes that cut across curricular areas.

Each Wednesday, while the teachers evaluate what is going on and plan what to do next ("next" may be tomorrow, next week, next term, or next year, depending on circumstances), members of the community such as symphony orchestra players or paramedics gather with the children in the auditorium and talk about their professions.

It sounds wonderful, and the mood and body language of the children suggest it really is. But at the end of the sixth grade, the world of the Key School ends and reports have come back that the kids "die" on confronting

a standard middle school. No one thought about this at the beginning. The elementary teachers were consumed initially with constructing an elementary school. Happily, in the fall of 1993, the Key School began a three-year expansion to become a K-12 environment. In addition, the high school will contain experiences in the community that will, one hopes, articulate with college and work.

Most people in school buildings do not have the extended vision of the Key School teachers, as they did not initially. Elementary teachers tend not to worry about events after sixth grade; middle school teachers aren't concerned with eleventh grade, and high school teachers don't trust the judgments about students made by middle school teachers. Most high school teachers do not show students A papers (and other graded examples) from universities. They do not take their students' papers to be graded at a university. Nor do they talk with business people or Army recruiters about what their non-college-bound students need after high school. No one looks at the whole picture. Someone should.

California's curriculum frameworks. Yet another example is the state of California's efforts to design more cogent curriculum frameworks, which have received high marks in most quarters. In constructing the frameworks, the state educators drew on some of the best professional thinking in the various subject areas. Yet when David Cohen and his colleagues at Michigan State University examined how these frameworks were being implemented, they found a fundamental breakdown in the process.[12]

The state had developed fine frameworks, but provided little or no staff development to help teachers understand them. Left to their own interpretations, teachers differed wildly on what the frameworks meant and what they implied for their own teaching practice. Some thought, wrongly, that the frameworks simply meant they should do more of what they were already doing. Others did not see that their teaching practice directly contradicted the assumptions girding the frameworks.

The situation in California is surely an improvement over the days in which curriculum materials were designed to be "teacher proof," or the more recent "conspiracy of good intentions" that produced bland, dull textbooks. But it still reflects the problems that occur when designers of the system do not involve the users of the system.

Need beginning to be realized

It has not always been well understood that failing to focus on the whole system jeopardizes reform. Indeed, one of the conclusions of the RAND Corporation's four-year, eight-volume study of educational change published in the mid-'70s was that comprehensive, systemwide change efforts were likely to fail.[13] But when Milbrey McLaughlin, a senior author of the study, revisited its conclusions in 1990, she determined that was one conclusion that had been wrong (largely because of the kind of reform effort that was studied):

> One implication [of this re-examination] is that special projects, or reforms aimed at discrete elements of the education policy system, are likely to be disappointing. The dominance of local implementation, the local factors that make variability the rule, and the fluid and often unpredictable character of the local institutional environment all underscore the systemic nature of the problems that change agent policies address. Special projects focused on single issues or single inputs typically (by necessity) ignore the systemic and interconnected conditions that influence classroom practice.[14]

McLaughlin could have added that change focused only on single programs is also likely to fail.

Now it is better understood that attention to the entire system must go well beyond simply spanning the age range within schools, or considering all players within the school setting. It must include the other social agencies that help children grow and develop.

Some conservative school critics find irony in the interest in consolidating education and other social agencies only a few years after the split up of the U.S. Department of Health, Education and Welfare. The appointment of a person from higher education as U.S. Secretary of Health and Human Services may have signaled, in part, a desire to align the two secretariats more closely. More importantly, in the fall of 1993, speeches by both President Clinton and U.S. Secretary of Education Richard Riley indicated an awareness of the interconnectedness of various service agencies and education.

It seems likely that taking a systems view of the schools and their contexts could produce a higher performing system than the one presently in place. Consider just a few of the current system characteristics:

- Several hundred to several thousand children in one building.
- Attendance for five days a week, three to six hours a day.
- Classes of 15 to 35 students.

- Classes with one adult.
- Books, blackboards, workbooks, worksheets and, occasionally, workbenches, computers, and laboratories.
- A standard curriculum, at the elementary grades at least, established by some authority above the district.
- An emphasis on decontextualized, formal skills.

Does anyone think for a moment that such a "system" maximizes how much children can learn?

When Lauren Resnick studied "Learning In School and Out," she found little resemblance between what happens in schools and what happens in other settings.[15] People have long spoken of a difference between "book learnin'[sic]" and "the real world," but in previous times they viewed the apparent estrangement pretty much simply as the way things were. Now they find such a poor articulation undesirable. Some people have realized that to separate "to know" from "to do," a segmentation much deplored by Dewey, is to produce an educational system that concentrates too much attention to what Alfred North Whitehead called "inert knowledge." Students spend too much time learning about isolated topics and too little time learning how to use that knowledge, a problem discussed in more detail in Chapter 4.

Surely we can develop a better, more functional system that provides a more useful, integrated education—one that better articulates the relationship between school and adult/work situations, and makes it even seamless. The nature of many jobs is changing and the changes have major implications for schools. if we do not examine the relationship of the schools to the rest of the system, we will miss a vital link and likely go astray.

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CHAPTER FOUR

HOW PEOPLE LEARN AND WHY IT'S IMPORTANT TO KNOW

The central elements in the educational system are the learners. We say "learners" rather than "learner" deliberately: While both American psychology and education historically have focused on individual abilities, achievements, and styles, recent evidence strongly impels the conclusion that cooperative and collaborative learning are more powerful than traditional, individual, isolated learning. The focus on learners is determined by multiple forces in international competition, by societal values, and by findings in cognitive psychology.

Some might contend that education has always focused on plural learners but, historically, this would not be true. Nor, until recently, did education focus on even *a* learner with the intensity now demonstrated. For most of American public education's history, it has not been forced to consider how to optimize learning. Expectations for schools were not always high.

While economic and social factors push for more education, the revolution in thinking about thinking and learning causes us to focus on the nature of learning in schools and out. Many of the ideas have emerged from highly theoretical and esoteric notions of what it means to think and learn, as well as from the arcane field of artificial intelligence. Yet many of these ideas can be well expressed in everyday English—as shown by Deborah Meier, principal of Central Park East Secondary School in East Harlem, in the summer 1992 *Teachers College Record:*

> Human beings are by nature social, interactive learners. We check out our ideas, argue with authors, bounce issues back and forth, ask friends to read our early drafts, talk together after seeing a movie, pass on books we have loved, attend meetings and argue out our ideas, share stories and gossip that extend our understanding of ourselves and others. Talk lies at the heart of our lives.[1]

History of Thought Clouds Learning Theory Today

This view of learning is more prevalent now than in decades past, but it still is not universally accepted. The reasons have to do with the intellectual history of educational and psychological research. Although seldom mentioned by name, the British Empiricist philosophers such as John Locke, Bishop Berkeley, David Hume, and James and John Stuart Mill hang over American

thought about thinking like a shroud. James Mill's theory of Mental Mechanics, in particular, resonates in the common view of learning.

Mental mechanics undergird basic skills approach

Mental Mechanics held that the idea of "house" is no more than the sum of the ideas of bricks, mortar, lumber, and nails. In the view of many today, complex knowledge is no more than the simple accretion of "basic skills" that must be learned before attacking more complicated work. A study by Lorrie Shepard of the University of Colorado found that most people working in the field of educational testing held such a theory of knowledge explicitly or implicitly.[2] In their view, complicated knowledge could be "decomposed" into the "building blocks" that corresponded to basic skills. The recurring call for "back to basics" among policy makers and lay persons alike reflects such a theory.

In addition to their theory of how knowledge accrues, the Empiricists established a powerful tradition in American philosophy and psychology by arguing that all knowledge comes from external sources, entering the brain from the senses. "Nihil est in intellectu quod non fuerit in sensu," wrote Locke: Nothing is in the mind that did not come from the senses.

Rationalists stress logic vs. sensory learning

While the British Empiricists were busy reducing complex ideas to simple ones, the Continental Rationalists of Europe such as Descartes and Leibniz were independently inventing calculus and other mathematical fields and establishing a far different approach to the study of mental phenomena. Contrary to the British emphasis on sensory impressions, the Rationalist view emphasized introspection and logic to understand the mind. Thought processes were the ultimate analytic tool. "Cogito ergo sum," wrote Descartes: I think, therefore I am.

Eventually, a compromise between the two extremes was formulated. In response to Locke's comment about nothing being in the mind that was not first in the senses, Leibniz responded, "Nihil intellectus ipse"-nothing but the mind itself. Following the works of both Leibniz and Hume, Immanuel Kant laid down the organizing principles by which the brain a priori imposes order on the information coming in from the senses. Thanking Hume for waking him from his "rationalistic slumbers," Kant still showed that Hume's

so-called pure empiricism actually required a mind that actively organizes thinking in certain predetermined ways.

Today we would say that the brain imposes this order innately. In current parlance, we would probably say that the brain is "hardwired" to behave this way. For example, Hume had argued that we acquire our idea of causality by repeatedly seeing event A followed at a certain time by event B. If the two events always occur in sequence and with the right timing, we come to conclude that A causes B. For example, a billiard ball (A) struck with a cue hits another billiard ball (B) and the second billiard ball moves. We say that A caused B to move. Hume thought it was purely the repeated experience of such sequencing that produced the perception of cause and effect. But Kant showed that it was possible to design a mind whereby B following A would leave no impression at all. The mind must be predisposed to impose this category of thought on events.

Researchers Adopt Psychology Model

Both the British Empiricists and Continental Rationalists figured largely in the early development of psychology, especially physiological psychology, but later the Empiricists won the day temporarily. It is only a short leap from the British Empiricist philosophers to the American behaviorists such as Watson, Hull, and Skinner who dominated thinking in the field from the 1930s to the 1960s. The history of psychology is critical to understanding the nature of educational research because educational researchers, and educators generally, took psychology rather than sociology or anthropology as the model for educational research to emulate.

One Swiss psychologist, Jean Piaget, who referred to himself occasionally as "an empirical Kantian" and always as a genetic epistemologist, did enjoy a period of popularity here in the 1930s before being swamped by the behaviorists. His popularity returned in the 1960s as the overblown behaviorist learning theories waned. "Never have so many worked so hard to learn so little," said one Churchill-inspired wag of the grand theories and their followers.

Piaget was actually an epistemologist—one who studies knowledge. Early in his career, he concluded that in order to understand the nature of knowledge in adults, one must understand how it develops from the earliest days of life. He thus studied infants (his own, initially) for periods of years.

Piaget decided that while children's thinking is qualitatively different from

adults, the processes that children and adults use are identical. When something happens that we have experienced many times before, it has no impact. We "assimilate" it. When something diverges from our experience, we attempt to "accommodate" it, changing what is in our heads to fit the new event, but also adapting the new event to fit what is already in our heads. If the event is too far removed from our range of accommodation, we ignore it or, as some research suggests, become anxious. In all instances, acquiring knowledge is an active process, not a passive one.

Constructivist view of learning dominates

Although Piaget's specific theories are little discussed among contemporary cognitive psychologists, his general view has claimed the day in the theorizing of American psychologists. Most psychologists now accept a "constructivist" view of cognition—holding that people actively strive to make sense of what is going on. In this meaning-making activity, they try to fit what is happening to them now to the knowledge already in their heads.

A simple experiment serves to illustrate how what we understand depends on what we already know. Consider this passage:

> The batters were merciless against the bowlers. The bowlers placed their man in slips and covers, but to no avail. The batsman hit one four after another with an occasional six. Not once did a ball look like it would hit the stumps or be caught.

Most American adults have no difficulty reading the words of this paragraph. They can decode the passage easily. It poses no unfamiliar or difficult terms, nor complicated syntax. For most, however, it also offers virtually no meaning. Most Americans simply lack the requisite experience to allow them to fit it into their heads. Yet any youngster in Great Britain, Hong Kong, or Australia could decipher it at once: It is an Australian newspaper account of a cricket match.

We need not rely on formal experiments to see these kinds of thought processes in action: Anyone who has ever spoken to an audience of any size, or held a staff meeting, knows from the questions asked that, in many instances, the audience or staff hears something other than what the speaker said or intended, or gives it a very different interpretation. Persons rooting for different teams often see the same athletic event quite differently.

Such differences are not mere partisan distortions, but reflect a fundamental process of the human mind. And it may be even more complicated

than that: Deborah Tannen's *You Just Don't Understand*,[3] argues strongly that the knowledge organization of men and women is quite different—a fact that probably has significant, but as yet only implicit, ramifications for curriculum and the structure of learning in schools.

"Situated cognition" accepted—but not incorporated into teaching

Educational researchers have also discovered that people are perverse: They do not learn out of school how they were typically taught in school. Nor do they use the knowledge they learned in school the ways they are "supposed" to. For example, in a naturalistic study of Weight Watchers, one psychologist observed the behavior of a man instructed to use ¾ of the daily allotment of ⅔ of a cup of cream cheese in a recipe. Had he learned properly as taught, he would have set up the algorithm ¾ × ⅔ = 6/12, then divided numerator and denominator by 6, reducing the fraction to ½. However, this depraved man formed the entire allotment of cheese into a low, shallow cylinder. Then, using a knife, drew two intersecting lines along the top of the cylinder, dividing it into quarters. Finally, he cut three of the quarters away and returned the fourth to the refrigerator, efficiently and accurately accomplishing the task set for him. It seems unlikely that he ever knew he was using ½ cup of cheese, or cared to know, or needed to.

This example is not isolated. It represents what cognitive psychologists have come to call "situated cognition." We don't think, this line of argument goes, in formalisms. Our thoughts are conditional on the context, the situation, in which we find ourselves.

But schools attempt to teach formalisms. As noted in Chapter 3, in 1987 Lauren Resnick titled her presidential address to the American Educational Research Association, "Learning In School and Out," and found little resemblance between the two.[4] In schools, the emphasis was on individual learning; outside, on shared learning and teams. Schools emphasized what she called "pure mentation"—what individuals can do alone and without tools. Most activities outside of school use some kind of tool to help thought, even an unintended tool as with the knife applied to the cream cheese.

Schools stress symbol manipulation instead. Outside of schools, the contextual nature of learning is recognized. Inside, there is an emphasis on symbol manipulation as an end in itself. Schools try to teach general skills that will apply in all situations.

But such skills seldom transfer. Transfer occurs better when a series of

situation-specific skills are taught where the situations have similarities. This applies not only to K-12 schooling, but beyond. For example, studies have found that expert radiologists do not use the mental processes they were taught to interpret X-rays, and that formal training in electronics and theories of trouble-shooting provides little knowledge and fewer skills than in actually performing trouble-shooting.

Gardner admonishes: We teach to only two "intelligences"

No book about cognitive psychology has caught the fancy of educators as much as Howard Gardner's *Frames of Mind*, a tome somewhere between a text intended for other psychologists and a book for lay audiences (and, as discussed earlier, the inspiration for the Key School). In this book, Gardner postulates that there is not one intelligence, as might be inferred from the single number derived from IQ tests, but seven. Gardner establishes criteria for deciding what an "intelligence" is, then describes seven: linguistic, logico-mathematical, musical, spatial, bodily-kinesthetic, inter-personal, and intra-personal. He chides schools for concentrating on only the first two, and considers that civilization ignores or slights the other five at its peril. Given the complex, multidisciplinary problems facing the world, he says, we need creative people who have novel approaches to solving those problems.

"Learning styles" further suggest many dimensions

At the periphery of the work in cognitive psychology are the purveyors of "learning styles." Although, the authors of various tomes on learning styles have yet to really establish that they count for much variance in people's behavior—or that they even exist in some instances—the notion of learning styles does suggest that there is a greater variety to mental processing than generally assumed in schools. A "one-size-fits-all" curriculum or instructional program cannot meet the needs of all children.

Education Strategies Should Reflect Learning Research

The problem for learners in the educational system is that learning in school does not reflect what we now know about learning. Earlier, we cited Deborah Meier on the social nature of learning outside of schools and on the importance of talk in learning. Meier goes on to say:

This kind of exchange is never allowed in school, nor modeled there—not between children nor between adults. Monthly faculty meetings are no better imitations of true discussion than the average so-called classroom discussion.[5]

All of the philosophers mentioned and most psychologists in this country have concentrated on the knowledge of individuals as if knowledge and individuals were independent entities. But learning is not only situated in a physical environment, it occurs in some kind of social context and, it turns out, learning is more powerful and effective in groups. Until recently, this most powerful form of learning, when it occurred in school, was called "cheating."

Research and common sense support group learning

The efficacy of group learning is driven home by an experiment examining achievement differences among ethnic groups. After the experimenters had factored out all possible variables, they still found that Asian students were scoring higher than students from other ethnic groups. Talking to the students in a search for new variables to explain the difference, the experimenters discovered that Asian students often studied in groups. In addition, immediately after the examination, Asian students convened to talk about it. Then after the results came back, they gathered again, pointing out to students who had scored low where they had gone wrong. Blacks, whites, and Hispanics almost always studied alone. They did not convene post-exam meetings to go over the material.

In another, more homely example, a speaker once asked several people at a meeting to individually list the National Education Goals. Despite the fact that this was a gathering of eminent educators, no one could do it alone. But when the question was thrown open to the entire audience, the list quickly emerged: No one knew it all, but all knew some of it.

Our folk wisdom codifies the power of group learning ("Two heads are better than one"), and delimits its effectiveness in a poorly structured situation ("Too many cooks spoil the broth"). But historically, we have not only not used group learning, we have punished children who tried.

Change of Pace Needed

One would think that teaching, the profession of learners, would transpire in a slow, reflective manner. Surely, the way in which people learn, the ways

in which we ought to assess that learning, and the desire for thoughtful, well-reasoned classroom statements, all require a deliberate pace.

One would think, but one would be wrong. All signs point to an increasingly frantic pace of instruction in a futile effort by teachers to cover a curriculum that has been called "overstuffed and undernourished."

People observing elementary teachers report them working long hours and doing 17 things at once, no one thing lasting very long. The dicta of the school demand that. Teachers often bring student work to after-hours meetings, hoping the intellectual demands of the meeting will not prohibit them from grading it (students' papers are invariably multiple-choice, fill-in-the blank, or matching words). And teachers have even been seen grading homework while waiting in line for concerts and other events to begin.

As one other observer of elementary teachers reported:

> The most outstanding adjustment displayed by all teachers was the ability to perform several tasks at the same time. This ability to perform a number of simultaneous tasks was an effective way to maintain classroom order and to facilitate rapid movement from one activity to another. It was a necessity due to the rapid changes in activity and the almost constant interactions.[6]

In view of the discourse about the nature of learning and of quality, one wonders what this "necessity" inflicts on learning. While there is much *talk* about "reflective practitioners," there is much research showing that if teachers increase their "wait time," the time from one question to another, to *three seconds*, rather than the typical eight-tenths of a second, the quality of answers increases.[7] Three seconds hardly permits a reflective approach to learning, nor does it induce such a habit of mind in students. it does, however, represent the pace of events in today's classrooms.

A study of middle school science classes observed that teachers who had unusually strong backgrounds in the subject found them making quick-paced lectures on topics that the students surely found incomprehensible. Transcripts of tapes showed jumps and turns in dialogue that were unconnected. In laboratory situations:

> Fifty-five percent of the labs required students to develop their own answers to a problem while providing step-by-step instructions about how to do so. . . Laboratory assignments were often poorly designed, poorly organized, incoherently written, and were not always explicitly linked to topic content. Students rarely were given any rationale for completing the labs.[8]

And we should note that in the 45 percent of the labs that did not require students to develop answers, the teacher simply provided them.

The authors of this study did not end up saying, "Boy, are these lousy teachers." they said, "Boy, is this a lousy system."

Researchers concluded:

It is hard to be optimistic about significant changes occurring in the tasks students are expected to complete. Current tasks function within an educational system that gives one teacher responsibility for 150 students a day and requires the superficial coverage of vast amounts of material. . .Changing the schoolwork that students complete is tantamount to changing the accepted definition of school itself.[9]

And yet, given what we have said about the nature of learning and of quality, such a definition change is required if, indeed, our educational goal is to optimize the system. Other researchers have observed that many students in science separate their personal knowledge of the world from what they learn in science class. Science is seen as not pertaining to their lives.

In studying school systems outside of this county, Richard McAdams for his 1993 work, *Lessons from Abroad*, interviewed a number of Fulbright scholars teaching here. Among the things these teachers reported to him was that students in this country have little idea of knowledge as something cumulative. From the above it is not hard to see why.

A system to promote reflection, in both teachers and students, would surely be one where teachers had more planning periods and could—and would—collaborate in planning. It would be one where, in much of the curriculum, the dictum "less is more" prevails. That is, students would likely become more thoughtful if they were able to give sustained attention to fewer topics rather than flitting from one to another. Schools must overcome the tyranny of scope and sequence. But it is hard to see how that will happen when it "is tantamount to changing the accepted definition of school itself."

Some have called for the abolition of the "Carnegie Unit" and other arbitrary units that have existed for decades. In recent years, Ted Sizer has perhaps been the most vocal and eloquent critic of the time-bound classroom. Still, the Carnegie Unit dominates the organization of time in this country. We need to change that. It's about time. . .and learning.

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CHAPTER FIVE

THE QUESTION OF STANDARDS FOR LEARNERS

There has been much talk about standards of late. "High but attainable standards" and "world class standards" are two oft-repeated phrases. The view seems to be that American students are not held to the high standards of other nations, nor to standards sufficiently high to maintain our international competitiveness in the next century. "America is the only country in the developed world without national standards," goes a common refrain.

Fairfax County, Virginia, Schools Superintendent Robert Spillane caught the Zeitgeist well in an *Education Week* essay. Our lack of standards:

> is education's dirty little secret. . .what most of the public has now learned, and many have called their representatives in Congress about, is that the abilities of [the] frontline work force in many competitor countries are substantially higher than they are in the United States, that these countries are educating everybody to higher levels than we are, and that one of the main differences between us and them is standards: They have them and we don't."[1]

But, here again, we must look at the facts. Not all countries have national standards (and many have only national *content*), and the American worker is unchallenged in productivity. While the Hudson Institute alleged that productivity had "declined substantially since 1965," it had not. Only the *rate* of productivity had slowed. (See Figure 5-A.) Furthermore, the United States has lost more than 3 million jobs since a 1979 peak (even though factory output has climbed sharply) because of a rapid growth in productivity. (See Figure 5-B.)

Yet the views on each of standards and an inferior workforce are widely held. In years gone by, the common response to a statement about standards would have been, "So what?" For many years, the phrase "only in America" connoted situations and events that could only happen in the United States, and was a source of pride. Now, for many, it is a source of anxiety.

Why People Want Standards

The pressures for national standards come from a variety of sources. The fear of failure in the competition for the global marketplace is only one. Others come to mind readily:

FIGURE 5–A

Productivity Improvement on the Decline

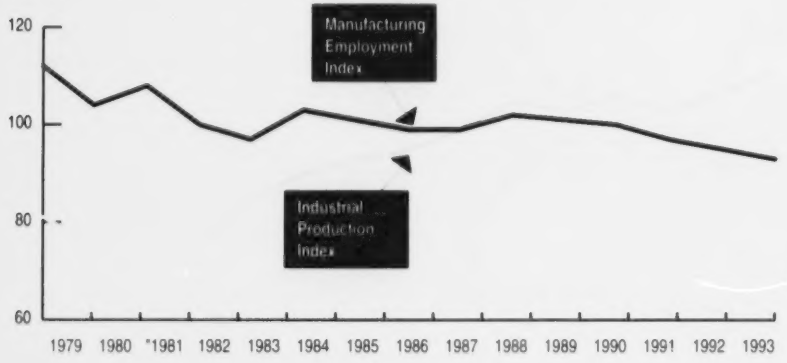
While the Hudson Institute alleged that productivity has "declined substantially since 1965," the graph actually shows that it is the rate of productivity *improvement* that has been slowing. We are getting more productive more slowly than in the past.

Source: Hudson Institute, "Economics Report of the President," January 1987.1

FIGURE 5–B

What's Slowing Job Growth?

While economic recessions and expansions have affected employment and production, the long-term trend toward smaller payrolls is likely to continue as efficiency improves. Chart shows manufacturing employment and productivity, indexed so January 1987 equals 100.



Source: Bureau of Labor Statistics, *Bloomburg Business News*

- Standards give people something to shoot at, something to measure progress by.
- We don't know where we're going in education and standards will help show the way. Schooling has lost its rigor and standards will restore it.
- High standards will help us attain the kinds of workers we need in our complex, technologically sophisticated society.

They are prone to make comparisons

Americans are also a norm-driven people. We want to know who's number one and where we stack up against the best. If we're not number one, we want to know why not, and what we can do about it. People continue to rank states according to SAT averages even though such comparisons are meaningless. (In 1993, for example, the percentage of high school seniors taking the SAT varied from 4 percent in Utah to 88 percent in Connecticut.) Our rank in international comparisons is the source of much wailing and gnashing of teeth—even though, as pointed out in chapter 2, the actual scores of American students are very close to the international averages in math and science, and very close to the top in reading.

Ever since the National Assessment of Educational Progress (NAEP) began releasing state-by-state comparisons and, in general, became more visible, pressure has mounted for a true national assessment. NAEP was not designed to reflect what is taught in school, and its scales and levels cannot be given the kinds of interpretations that NAEP officials and U.S. Department of Education all too often do. People want a nice, clean number that permits easy comparisons.

Increased mobility, diversity cause problems

Finally, some observers point to the fact that 20 percent of American students change schools each year and the research showing that this poses problems for students and teachers alike. The problems would go away, they contend, if the same material were being taught in each classroom around the nation. A common set of standards would give students something to shoot at and at the same time help bring together our culturally fractious nation.

Reasons for *Not* Having Standards

Against this set of arguments *for* national standards are at least equally persuasive as arguments against them.

People learn differently

The multiple intelligences theory noted earlier would seem to call for individualized instruction: Different people will have differing development of the different intelligences and different patterns among them. To maximize learning, instruction needs to be tailored to play to these differences. The constructivist theories of cognition lead to a similar position: If everyone's cognitive structures are to some extent unique, uniform standards will not meet some students' needs.

There is no one best solution

Standards could also remove professional decision making from teachers and bring a dull uniformity to the classroom. Elliot Eisner has argued against national standards on the grounds that there are "a number of educationally defensible versions of mathematics education, social studies education, science education, arts education, or language arts education . . . . Education is about learning to deal with uncertainty and ambiguity. It is about learning to savor the quality of the journey. It is about inquiry and deliberation. It is about becoming critically minded and intellectually curious, and it is about learning how to frame and pursue your own educational aims."[2]

Standards testing might have ramifications

Most proposals for national standards and assessments call for testing at grades 4, 8, and 12. Problems are associated with all three levels. Students in grade 12 seldom take any test seriously except the SAT or ACT, tests with obvious if over-estimated consequences. It is not clear what the grade 12 assessment attached to standards would do for individuals. For grades 4 and 8, such assessment contains a new and dangerous element: We have never had "high stakes tests" at these ages. Do we want 9-year-old children to have to cope with such? What will happen to fourth graders who aren't "up to standard?" Retention in grade? The whole body of research on retention speaks with a single voice: It doesn't work. Summer school? Can we command such and even, if so, who will pay for it?

The tests are of questionable sophistication. Of course, the kinds of tests being proposed for the assessment of national standards are still immature in terms of the technology of testing. We have had multiple-choice tests in their present form for 75 years. Only in the last five or six years has attention been given to more complex testing. In Vermont, the state with the most experience to date with assessments using portfolios, the assessments have not yet attained a great deal of reliability. In this litigious nation, one can only imagine the flood of lawsuits that will occur if assessments are used to make life-altering decisions.

Standards won't lead to needed improvement

Perhaps the most damning aspect of national standards, though, is their essential irrelevance. The Second and Third "Bracey Report on the Condition of Public Education" showed clearly that schools that will use the standards don't need them. Schools that need help—in the form of money, equipment, textbooks, and even working plumbing—won't use the standards and will only be told again that they are not measuring up. Using a different line of argumentation, Larry Cuban reached the same conclusion: National standards will bypass the 40 percent of schools that most need improvement.[3]

Process for Setting Standards Unclear

The debate over the pros and cons of standards is likely to continue for some time. Exactly how such standards are to be established has never been specified and this raises questions about the enterprise. At this writing, professional organizations are developing standards in the usual curriculum areas and through some, yet-to-be-determined process, these will become national standards. The standards developed by the National Council of Teachers of Mathematics (NCTM) appear to be the model other curriculum areas will follow. In many discussions about these standards, no distinction is made between content standards and performance standards.

Coordination with other efforts needed

Also at this time, there is a New Standards Project co-directed by Lauren Resnick at the University of Pittsburgh and Marc Tucker at the National Center on Education and the Economy in Rochester, N.Y. How this effort will fuse with the work of the professional groups has not been addressed.

Funded from foundation grants, the project's goal is two-fold:

- To establish high but attainable standards in five curriculum areas; and
- To develop a "voluntary" assessment system in grades 4, 8, and 12.

The assessment system is to include all forms of tests, including multiple choice, essay, performance, portfolios, and exhibitions. These various testing forms are to be somehow "calibrated" so that scores from, say, a multiple choice test used by one state can be compared with, say, a performance test used by another state. Many feel that this calibration is not technically possible and, in fact, in recent months the word seems to have disappeared from the New Standards lexicon.

We can note in passing that the New Standards Project has been criticized for another shortcoming, although not one of its own making. Although Resnick is a cognitive psychologist, the New Standards Project is organized around a very traditional core curriculum and it is not clear how much psychology will enter the development process. This traditional organization also is taking place at a time when many people are calling for instruction organized around themes or concepts that cut across traditional topics (a strategy compatible with cognitive psychology theories). Most current textbooks and work materials have attracted criticism because they present isolated facts unconnected to other facts in the same book or the facts of other curriculum areas. By staying with the traditional topical approach to curriculum, the New Standards Project could reinforce this isolation.

History of minimum competency testing ought to be considered

While various groups are in the process of establishing world class standards, we should not forget that in the 1970's, 35 states established some kind of minimum competency testing programs. These programs could well have been characterized as creating "low but attainable standards." Yet still some students did not meet the standards even after taking the tests three, four, or a half dozen times.

How, then, such students will clear the new "high but attainable" hurdles is not clear. The answers I have received when I have posed this question have been notable for their naivete about schools, the students in them, and the relationship between changes in policy and changes in practice. In any case, it is important to note that *setting standards does not necessarily increase performance.*

In any case, where to set the standards is a critically important issue,

and difficult to resolve. The 1993 NCES report "Education in States and Nations"[4] further analyzes the data from the Second International Assessment of Educational Progress. One such analysis revealed enormous variation around the average scores for states and countries. As one goes from Mississippi with the lowest average score to Taiwan with the highest, one traverses a distance of 39 NAEP scale points. But as one goes from the 1st to the 99th percentile of Taiwan students, one sees a range of about 150 points. This raises doubts about making generalizations regarding any nation's schools based on average scores. More immediately, it raises the question of where a cut score could be placed that people would call meaningful, which would not also flunk a large percentage of students. What would be done to handle the ensuing chaos has not been explained.

Practitioners need to be involved

The NCTM standards have been well-received in most quarters, although those quarters do not yet include many classroom teachers. For many of them, the standards remain invisible. In an arena such as this one, teachers' voices are rarely heard, and we must question: *How far through the classroom door can a set of standards get if teachers feel no ownership of them?*

Standards shouldn't put youngsters at risk

In the process of setting standards, care should be taken to avoid the standard-setting problems at the low end of the age scale. People genuinely differ on whether kindergartens should be more developmental or more academic in nature. In some places, kindergartens have become "mini-first grades," a development which puts the younger children in the class at a disadvantage and sometimes at risk. In such settings, one hears discussions about whether a child is "ready" for kindergarten (or for first grade at the end of kindergarten).

After listening to these arguments for a number of years while conducting research in kindergartens, Lorrie Shepard of the University of Colorado concluded that the concept of readiness should be abandoned.[5] She feels it perverts the moral tone about what education should strive for: It implies that "readiness" is a condition that dwells within a child when, in fact, it is a complex constellation of affairs involving the school, the teachers, the parents, and a host of others in a micro-system. The common concept

of readiness also implies that the child exists for the convenience of the school, not vice versa.

It is worth noting, that when American educators and psychologists and, sometimes, reformers get into standard-setting activities or deal with norms, they are prone to try and speed things up. When American psychologists concluded that Piaget's stages were not methodological artifacts, their first interest was in how to get kids through them faster.

During most of our history, there have been occasional counters to this national characteristic. In 1782, Thomas Jefferson warned:

> There is a certain period of life, say from 8 to 15 or 16 years of age, when the mind like the body is not yet firm enough for laborious and close operations. If applied to such, it falls an early victim of premature exertion; exhibiting, indeed, at first, in these young and tender subjects, the flattering appearance of their being men while they are yet children, but ending in reducing them to be children when they should be men.[6]

More recently, Paul Diederich wrote this cautionary tale in a 1959 critique of J.B. Conant. Its message is both important and overlooked in the current climate:

> As we advocate a 'get tough' policy with these superior students, we should realize that we are advocating a daily schedule for growing boys and girls, at the most social and fun-loving period of their lives, that is a lot tougher than any adult puts in—except a few harassed executives with ulcers. Whenever we teachers go to educational conventions, do we regularly go to seven or eight meetings per day, sitting on hard chairs in cramped quarters the whole time, and then return to our hotel room to put in three or four more hours boning up on what the speakers wanted us to know, so that we could prove that we understood it and remembered it when they quizzed us about it the next day?...You may say, 'This is sheer exaggeration. Surely going to high school is much nicer than this." No it is not, and I know whereof I speak. I have just been sitting in classes day after day.... I solemnly declare that at the end of each day visiting classes—even though I am treated as a VIP, not as a guilty student—my fundament is sore, my legs are cramped, my eyes are tired, my brain is reeling, and I would rather do anything on earth than study for three or four more hours what these students are supposed to study. It is

not that the teaching is bad; there is simply too much sitting down, listening to talk, talk, talk. We say that these students ought to learn to "work hard," and they would not mind that in the least; it is the sitting down and listening all day in a space half the size of a grave that gets them down. . . .[7]

The teachers come out of it as scarred and tired as the students. The art of teaching is so delicate and difficult that I would be willing to bet that we shall wind up with the fully documented conclusion that no one can do it effectively for more than two hours a day. All of this dreary, ineffectual round is based on the assumption that learning proceeds best when administered in doses of five periods a week plus homework for all academic subjects. This assumption is unsupported by a shred of evidence in all experimental literature, contrary to common sense, and contrary to the practice of almost all colleges. Dr. Conant does not say one word to justify it.

Standards should reflect professional levels

Ultimately, as with athletic and performing arts judgments, we must take our standards from the professional level. It is telling that when we watch, say, a basketball game, we have implicitly, and perhaps sometimes explicitly, in our heads a knowledge of the professional level of play, and perhaps even of the best current performers within the sport. All-star games allow us to observe the best-of-the-best together.

It is doubtful, however, that a teacher ever reads a student's story thinking of its images in comparison with those of, say, John Updike, or reviews a student exposition comparing its prose to that of John McPhee (unless he or she suspects plagiarism). But why not?

One we leave the field of literature, the distance of school students from exemplars and standard setters becomes even more obvious. Authors, at least, publish works in popular periodicals. Scientists and mathematicians generally do not. It is little wonder, then, that Magdalene Lampert finds that the way children approach mathematics in fifth grade bears absolutely no resemblance to mathematicians doing mathematics or discoursing about it.[8] (In addition to conducting research at Michigan State University and, starting in 1993, the University of Michigan, Lampert teaches mathematics in elementary schools, giving her a perspective seldom found among researchers.)

It is not simply the abstruseness of what adult mathematicians do, but the communication about the concepts that is vastly different. When Lampert attempts to teach students to talk about mathematics in ways used by mathematicians, interesting things happen. Conversations sometimes resemble the genuine discussions that Meier in Chapter 3 declared were so lacking in schools. Children come to see mathematics not as a set of fixed rules that come from "out there," but as a human construction, under constant revision. (Some of the children, after four years of traditional mathematics, do not initially gravitate to Lampert's approach. Most of the resisters want her to take the traditional teacher role of information giver, while a few want to vote on what's right or follow idiosyncratic lines of thought because it's "their way.")

Standards should reflect "customers'" needs

There is an approach to devising standards little tried in education, but quite common in industry and commensurate with a systems approach: The customer decides what the appropriate standards are with their purchases. Just who the "customer" is in education, of course, is difficult to say.

There are two models of schooling that flow from a customer determination of quality. The first considers the parents as the true customers, the second thinks of customers in terms of the next level of consumer.

The first model argues for a free market approach to schooling, with parents free to choose whatever schools they wish. Good schools are expected to thrive and expand. Poor schools will be challenged to become good schools or go out of business. This model is discussed in the next chapter.

The second model of schooling holds that the next consumer is the customer of the earlier consumer, albeit not a customer free to buy or not buy until the "product"—the student—reaches college-age. That is, the next consumers of college graduates are graduate schools, business and industry and, to a lesser extent, the military. For high schools, the next consumers are colleges, business and industry, and the military.

One caution on "local" customers. Although establishing standards in terms of customer satisfaction raises many questions and problems, it seems the most appropriate approach to the question of standards in schools. It is an approach that lends itself more to local standard setting than to national standards, however, because local conditions will be the most important considerations. Construed too simplistically, it assumes that the standards

at the next level are the appropriate ones, and, without external oversight by other concerned parties, they may well not be.

Businessmen, for example, have been known to self-servingly ask schools to teach and set standards for some skills that would more appropriately be left to the businesses to develop and apply as part of on-the-job training. Indeed, the SCANS and Sandia reports indicate that American employers often provide very little training for their employees (50 hours for new auto workers at U.S. manufacturers, 350 hours for new auto workers at Japanese manufacturers in Japan, 300 for new workers at Japanese manufacturers in the United States). These studies also found that business and industry in this country spend a disproportional amount of training money on skilled and college-educated employees, while those in other countries develop skills at all levels.

Consumer approach supports continuity. Notwithstanding the problems in resolving the perhaps competing characterizations of quality by differing consumers, the notion of next-level-of-consumer has great appeal. It allows for a continuity, or at least an articulation, among institutions that now inhabit separate, non-communicating worlds.

Here's one personal example: Following a suggestion from Grant Wiggins at the Center for Learning, Assessment and School Structure, this author recommended to a group of teachers that they take a set of senior essays over to the local university along with some money, and that they use the money to pay professors to grade the papers. It was further suggested that they bring some graded freshman papers back to show their students.

The idea startled them. Currently, the prime use of the (vaguely perceived) university standards, for teachers, seems to be to try to motivate students with comments such as, "It won't be this easy in college!" And it isn't. Many students experience a one-semester crash or more before they abandon their previous levels of effort and ratchet up to what the collegiate level demands. There is no reason that this disparity should exist. Surely, we can eliminate or reduce the discontinuity between high school and college work without producing the Japanese system where students work extra hard in an attempt to get into colleges (especially into the few colleges considered prestigious), but then burn out and spend many years treating their campus life as essentially a long nap.

One Canadian district, Carleton, has taken the next-consumer-based-standards approach seriously. Students are given booklets containing the

rubrics that are used to score papers. They also are given 10 exemplary papers and explanations about why those papers merited the grade they received.

This contrasts sharply with the approach to education in much of the United States where, according to Meier, "schooling becomes a vast game in which teachers try to trick students into revealing their ignorance while students try to trick teachers into thinking they are not ignorant." If students in high school could see exemplars of good college work and understand the rationale behind the various grades, it would make education much more meaningful to all concerned.

A system of standards, open and known to all, coupled with instruction that reflects how people learn and what they should learn, would cure a lot of the pathology seen in the last quote. Currently, we operate a system that all too often is analogous to placing a hood over people's heads, leading them onto a basketball court, telling them to shoot baskets, then grading them in "basketball." the students do not know what to expect and the feedback they get provides little or no information on how they can improve.

A system of standards, with accompanying benchmarks, would do a lot to alter this. Such a system would also align itself well with psychological considerations on how people learn.

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CHAPTER SIX

SYSTEMS AND THE ASSESSMENT OF LEARNERS

At the end of the last chapter, the word "benchmark" is used. This is a term common in industry or athletics, but seldom seen in education. A system of education, though, needs benchmarks in order to assess progress. More importantly, it needs benchmarks to assure quality. "Quality" in schools is seldom discussed openly. In schools, it has more of an "I'll-know-it-when-I-see-it" character. (And to some extent, this fuzzy aspect of quality is unavoidable.)

Lauren Resnick, in delineating the characteristics of higher order thinking, noted that it, too, was difficult to specify in the abstract and in advance. If one holds that such thinking is a desirable outcome of schooling, then some vagueness is necessarily introduced into the system. Indeed, in his writing about the concept of synthesis, Benjamin Bloom approaches a point of saying that it cannot be known in advance.

Current Approaches Obscure Quality

Whatever the nature of quality, there is general agreement that there could and should be more of it in schools (see, for example, William Glasser[1]). A number of factors, however, keep quality from view. The current assessment system, for example, does not permit us to see it. Multiple choice questions, which dominate this system, are poor lenses for actually, directly viewing quality performance. Scores reported in terms of percentile ranks, grade equivalents, and the truly incomprehensible Normal Curve Equivalents indicate only if a student's performance is as good as, better than, or worse than some "norm"— or the others who took the test, or others of the same age. They do not, cannot, tell us if a performance is good, bad, or indifferent.

Quality also is obscured because we are not treating learners in ways that optimize learning, as discussed in chapters 3 and 4. One of the promises inherent in the idea of "authentic" tasks and tests is that they will unleash students' pent-up desires to actually do well. Whether that is true or not depends on a host of factors, not all of them under the control of the school. But it is clear that, for learning to "break out all over" as Philip Schlechty of the Center for Leadership and School Reform once lightheartedly put it,[2] the tasks to be learned, the methods of instruction, and the assessment of the outcomes all need to be changed.

Why Not Take Our Lead from Athletes?

Assessment in education should resemble the assessment of the performing arts and athletics. In particular, the scoring and reporting system of cross-country running seems appropriate to a system where everyone counts and continuous improvement is the goal:

> In cross-country, each team has seven runners. The scores of the first five count in a team's total. Everyone runs the same distance, but it is hardly expected that they will all finish at the same time. While the scores of the sixth- and seventh-place runners are not counted in the team's total, if team A's sixth- and seventh-place finishers finish ahead of team B's fifth-place runner, they diminish team B's score. Thus, everyone can be important to the outcome of the match. In addition, times are kept for a season and in some places for an entire career of four years. The goal for each individual is to get better over time. Progress over previous performances and attaining a new "personal best" is emphasized.

The current system of tests and measures, ability tests, achievement tests, college entrance examinations, and the National Assessment of Educational Progress (NAEP) are all, individually and collectively, inadequate to measure the quality of the system or the quality of individual performances, or to benchmark progress.

Tests Rarely Measure What's Important

Achievement tests, with the possible exception of the rarely used Iowa Test of Educational Development and the more popular Degrees of Reading Power, do not assess complex intellectual behavior, not to mention other valued qualities.

A 1992 study commissioned by the National Science Foundation examined, item-by-item, for grades 4 through 12, commercial achievement tests in mathematics and science and tests that accompany textbook series. In mathematics, for both types of tests, only 3 percent of the items assessed high quality content; only 5 percent evoked higher order thinking.[3]

Another analysis by Thomas Romberg at the University of Wisconsin found that mathematics achievement tests do not map well into the content areas specified in the highly regarded standards published by the National Council of Teachers of Mathematics (NCTM).[4] The tests overemphasized a

few areas, such as computation, and ignored many others almost entirely. (New editions of some recently revised tests now claim to reflect the NCTM Standards.)

Despite contentions that the United States has a de facto national curriculum because textbooks are similar, in fact, local variation is the rule. Thus, a set of achievement tests cannot be linked specifically to any particular curriculum. If it were, the tests' publishers could only sell to districts and states using that curriculum.

Naturally, publishers want the largest possible distribution for their tests. So test developers must use only questions that sample the most generic skills and knowledge. Such tests cannot say much about the educational outcomes of a specific curriculum (although, if the stakes become high enough, such tests will become the curriculum).

Why all the secrecy? The secrecy surrounding tests perverts the whole educational system. If tests are supposed to measure what we think is important, how can we possibly justify not telling people what is on them?

Bell curve doesn't support education's goals

In addition to these content problems, the most common types of tests also have undesirable statistical qualities.

Because this country has historically used tests primarily to separate sheep from goats, not to improve learning, the items selected are largely those that 50 percent of the students fail. Such items maximally disperse students along a normal, bell-shaped curve.

The appropriate outcome of education is not a normal curve, of course, but what statisticians call a J-curve. In a J-curve, only a few people score low and most score high. As Bloom, Madaus, and Hastings put it:

> There is nothing sacred about the normal curve. It is the distribution most appropriate to chance and random activity. Education is a purposeful activity, and we seek to have the students learn what we teach. If we are effective in our instruction, the distribution of achievement should be very different from the normal curve. In fact, we may even insist that our education efforts have been unsuccessful to the extent that the distribution of achievement approximates the normal distribution.[5]

In addition to these statistical problems, there are severe questions about whether or not the multiple-choice format of tests can ever measure the outcomes educators truly consider important.

Ability tests just cloud the picture

Ability tests often are alleged to measure "potential." They differ from achievement tests only in that, while the skills and knowledge of achievement tests are mostly taught in schools, it is not clear where the skills tested by ability tests are learned.

For example, one item on a popular ability test presents the student with the analogy, "Canada:United States as _____:Kenya." To answer this item correctly, one must first understand the meaning (or the game) of the analogy, then apply highly specific geographical knowledge. The answer is Ethiopia, although a plausible case could be made for Uganda or Tanzania. Ethiopia "sits on top of" Kenya as Canada "sits on top of" the United States. The argument for Uganda or Tanzania would be that, as Canada is an English-speaking neighbor of the United States, so are Tanzania and Uganda English-speaking neighbors of Kenya.

The Standards of Testing promulgated jointly in 1985 by the American Educational Research Association, the National Council on Measurement in Education, and the American Psychological Association state that there is little, if any, meaningful difference in the constructs of ability and achievement as reflected in paper-and-pencil tests. A report on ability testing from the National Academy of Sciences reached a similar conclusion. It appears that the use of "ability" tests, whether or not in conjunction with "achievement" tests, would obscure any picture about educational standards or outcomes, not clarify it.[6]

College admissions exams also fail the relevancy test

Neither of the two popular college entrance examinations, the SAT and the ACT, was intended to measure the outcomes of schooling. Indeed, for many years, the College Board and the Educational Testing Service (sponsors and developers, respectively, of the SAT) argued that the SAT was curriculum-free and impervious to coaching.

Of course, these claims now are recognized as naive. It would also be naive to think that a test such as the SAT—consisting only of 85 vocabulary,

antonym, analogy, and reading comprehension questions, and 60 arithmetic and simple algebraic and geometric concepts questions—could fully measure the results of 12 or 13 years of education.

In recent years, the College Board has, apparently for political and marketing reasons, argued that the SAT can measure improvements in education. But this position is not tenable. The "new" SAT, implemented in 1994, may contain more school-relevant questions, but suffers the same problems of breadth and depth. Initial impressions of the new SAT have not described it as much different from the old SAT.

The NAEP is flawed as well

Similarly, the NAEP (National Assessment of Educational Progress) was never constructed to reflect a particular curriculum. In its inception, it was a creative approach to testing that involved asking students some questions that all students might be expected to know and some questions that very few students might be expected to know. It also used a variety of item formats. This is in contrast to the typical achievement test that comes only with multiple-choice questions chosen so that about 50 percent of students fail each question.

The NAEP has undergone an unfortunate transformation in recent years through twin attempts to provide criterion-referenced interpretations of test scores and to establish scales and standards using the existing item bank.

In regards to criterion-referenced interpretations, NAEP officials often make statements like the following:

> More than half of the nation's 17-year-olds appear to be inadequately prepared either to perform competently jobs that require technical skills or to benefit substantially from specialized on-the-job training. The thinking skills and science knowledge possessed by these high school students also seem to be inadequate for informed participation in the nation's civic affairs.[7]

Naturally, such statements are devoured by the press, but various education writers have absorbed them uncritically as well. Thus we find Lawrence Stedman of the State University of New York writing that, "NAEP data show that only a minority of students reach the levels considered necessary for higher education, business, and government."[8] And Albert Shanker, president of the American Federation of Teachers, claiming that the "findings of the

NAEP indicate that few students are ready to do real college-level work or to handle a good job."[9]

Robert Forsyth of the University of Iowa has argued that such criterion-referenced interpretations are not permissible, although he does not put it quite so bluntly.[10] After a detailed examination of how the scales are constructed and a discussion of their statistical properties, Forsyth asks, "Do the NAEP proficiency scales yield valid criterion-referenced interpretations? . . . Given the observations presented above, I would answer, without reservation, 'No.'"

As for setting standards on the NAEP, the NAEP item bank was never constructed for such purposes and is inadequate to it. Nevertheless, the National Assessment Governing Board (NAGB) attempted it. In addition, NAGB hired a team of highly regarded educators to evaluate the standard-setting process. The team concluded that it did not work.[11] NAGB's response to this bad news was to summarily dismiss the evaluation team, thus politicizing the NAEP.

A 1993 report from the U.S. General Accounting Office (GAO) determined that the standard-setting procedure, while improved between 1990 and 1992, remained flawed to an extent that rendered invalid the kinds of judgments NAGB wished to make:

> We conclude that while ACT's 1992 procedures have addressed some of the problems that affected the 1990 standard setting, the fundamental problem of finding a test score that can validly be interpreted in terms of NAGB's definitions and descriptions remains unaddressed. If anything, the gap between the level definitions, the achievement level descriptions, and actual performance at the NAEP score selected for each level is likely to be greater than before. Unless and until NAGB can show that its approach is internally consistent and produces valid interpretations of the NAEP scores selected to represent each level, it should either refrain from reporting in terms of achievement levels at all or present the levels scores simply as NAGB's judgmental standards for partial, solid, and superior performance, without further interpretation.[12]

In general, the GAO concluded that the standards set by NAGB "do not necessarily imply that students have achieved the item mastery of readiness for future life, work, and study specified in NAGB's definitions and descriptions."

Researchers at the National Center for Research on Evaluation, Student Standards, and Student Testing (CRESST), a consortium of the University of California at Los Angeles, the University of Colorado, and the RAND Corporation, reached similar conclusions. Students performing at a certain NAEP level were found to be able to do some problems they shouldn't be able to do, and unable to do some they should. The NAEP mathematics assessment, said the CRESST researchers "did not measure some of the attributes included in the descriptions of the achievement levels and measured some other attributes only poorly. . . . In sum, then, our analyses do not support the validity of the published content descriptions as characterizations of what students within specified score ranges can do."[13]

The problems discerned by the NAEP evaluation team, the GAO, and CRESST would, alone, be sufficient to rule out NAEP as an index of quality. But, in addition, NAEP also underestimates the levels of achievement of American students.

The National Center for Fair and Open Testing (FairTest) figures that American schoolchildren bubble in 100 million answer sheets a year. Some think that estimate conservative. Whichever, American kids sit for tests so often, they do not take yet another one seriously unless they have some reason to do so. The NAEP gives them no reason because it enters and exits their lives in a single day, leaving no trace. Neither parents, nor teachers, nor the students receive any feedback about the children's performance and what it might mean.

To the students, a test like the NAEP is a yawner. When Cherry Creek, Colorado, students participated in a 1991 trial of NAEP state-by-state comparisons, fully half of the teachers reported that they had trouble keeping the children on task.

Because tests used in international comparisons have no more meaning for American students than the NAEP, these comparisons suffer the same problem. Such comparisons might be salvageable if all students reacted to the tests the same way. But, as discussed in the next few paragraphs, the dearth of motivation in U.S. children may not affect the students in other countries.

Student Motivation Affects Comparisons, Validity

No one should underestimate the importance of motivation to performance on tests in school. One superintendent of a mostly rural district in Virginia

concluded that the tests taken as part of the state testing program, while used to pass judgment on the district itself, held no interest for his mostly noncollege-bound students. In hopes of making the tests more pertinent, he recast them as analogous to athletic competitions. As in athletics, the goal was to outscore the archrival adjacent county. During the week of testing, teachers dressed as cheerleaders and led pep rallies in the auditorium where students in the affected grades were cheered on by their teachers and other-grade peers. Scores improved 20 to 35 percentile ranks, depending on test and grade.

At one level, the superintendent's actions make sense: Administrators and other parties want to ensure that students perform at their best. On the other hand, on a standardized achievement test like those found in most state programs, the scores of those taking the test "for real" are compared to those in a national norming sample who receive no special preparation. (Indeed, it is actually in the school's interest to perform poorly when the test is being normed in order to look better when taking the actual test.) In any case, motivation counts—and that motivation for doing well on tests varies considerably from situation to situation.

It is worth noting, as an indicator of the importance placed on tests, that the Virginia district's strategy came to light in the first place because the Virginia Department of Education had had so many instances of "inappropriate administrative procedures" in the state testing program that it had to create a computer program to identify districts with unusual patterns of test score changes.

Motivation no doubt affects the outcomes of international comparisons, but how much is not known. The students likely show the same level of interest in international exams as they do for the NAEP. In contrast, Archie Lapointe, director of the Second International Assessment of Educational Progress (IAEP-2), reported a different reaction in Korea. As the selected students' names were called, they stood and exited for the testing room to loud applause from their peers. Such an honor to be chosen to perform for the nation! Truly for these students, the IAEP was the equivalent of an educational Olympics.

The issue of motivation is part of a larger issue in testing that is usually given short shrift by psychometricians, namely face validity. If tests don't have face validity to those taking them, they will not perform as well as they could. One research study found that elementary school students trusted tests as

indicators of accomplishment (that is, the tests had face validity), but middle and high school students had grown suspicious of them.[14]

A New, "Authentic" Approach Is Needed

The characteristics of the various types and formats of current tests make it obvious that if we establish the appropriate approach to learning as discussed in Chapter 3, the current assessment system would not permit us to see how well students are learning. It would make little sense to have children engaged in meaningful tasks and collaborative learning using multiple intelligences if we then sat them down to bubble in answer sheets for a paper-and-pencil examination. We need an entirely new approach to the evaluation of learner outcomes.

As hinted at in the beginning of this chapter, the kinds of assessments called for to even approach what W. Edwards Deming called Total Quality Management are those that generally go under the not terribly useful but popular name, "authentic assessment." An example will illustrate the difference between authentic assessments and the usual tests.

A typical standardized test question might look like this:

What is the volume of a cone that has a base of 78 square centimeters and a height of 12 centimeters?

a. 30 cm^3
b. 312 cm^3
c. 936 cm^3
d. 2808 cm^3

Such a question has no context. Its worst feature is that we have no way of knowing why a student chooses any of the alternatives. Did he guess? Answer by rote application of an algorithm? Think it through logically to the right answer? Think it through logically to the wrong answer (a frequent occurrence in younger children)? Or react to some "local condition"? (In one New York district, when a test question asked, "What animal is most likely to be found on a farm?," most children eschewed the "right" answer—chicken—in favor of "giraffe." A nearby game park with the words "animal farm" in its name used a giraffe in its logo.)

This kind of question, and the instruction that precedes it, leads students to meaninglessly apply algorithms. The NAEP once confronted students with this problem: 1,128 soldiers need to be transported from one base to another.

Each bus holds 36 troops. How many buses are needed? Twenty-nine percent of the students gave the answer "31 Remainder 12." Observers note that when students take such context-free tests, they are devoid of affect, save those who are visibly anxious.

A revision of the first question would improve matters:

> A student goes to buy an ice cream cone at the store on a warm summer's day. The cone has a length of 12 cm and the ice cream scoop is a sphere with a diameter of 5 cm. If the ice cream melts while in the cone, will all the melted ice cream fit in the cone? Explain and support your answer.

This is largely the same problem as the first, except that it includes the calculation of the volume of a sphere as well as a cone. It further requires the student to compare the two volumes and to support the answer. The problem is set in a meaningful, if not realistic, situation.

An even more authentic assessment, though, is one like the following:

> ***Background:*** Manufacturers naturally want to spend as little as possible, not only in making the product, but on packing and shipping it to stores. They want to *minimize* the cost of production of their packaging, and they want to *maximize* the amount of what is packaged inside.
>
> ***Setting:*** Imagine that your group of three people is one of many in the packing department for M&M's candy. The manager of the shipping department has found that the cheapest material for shipping comes as a flat piece of rectangular paperboard. She is asking each group to help solve this problem:
>
> What completely closed container, built out of the given size of paperboard, will hold the *largest volume* of M&M's for safe shipping?
>
> 1) *Prove* to the company executives that both the shape and *dimensions* of your group's container idea maximize the volume. You will turn in a *convincing* written report to the company managers, making your case and supplying all important data and formulas. Your group also will be asked to make a three-minute oral report at the next staff meeting. Reports will be judged for *accuracy, thoroughness, and persuasiveness.*
> 2) Build a model (or multiple models) out of the paperboard of the container shape and size that you think solves the problem. The models are *not* proof; they will *illustrate* the claims you will offer in your report.[15]

Now we have a problem that respects the students and is worthy of solution. It is a real world problem, requiring justification of answers. It also requires collaboration, much as in the world of work, and the application of knowledge for a most common and important purpose: to persuade others of the rightness of the answer.

The benefits of authentic assessment

There is no "gotcha" about the test; everything about it is public and nonarbitrary. This assessment measures not what knowledge the student *has*, but the far more important outcome of what the students can do with that knowledge. And students have multiple attempts at using and demonstrating their knowledge. They just don't give the first answer, nor a single summative "answer" that is right or wrong.

Such a problem would tell a teacher a lot about students' understanding. The teacher could assess comprehension through students' questions as well as through their answers. (See sidebar.) By building a model, students can test their solutions for viability.

Finally, this assessment has a likely outcome of *improving* performance, not just measuring it. This kind of test is an assessment adequate to and reflective of meaningful education. It also reflects the nature of what the learner in the system is like.

Grant Wiggins, in *Assessing Student Performance*, provides another example of authentic assessment and its benefits. He presents a long passage from which test questions are derived. The passage analyzes the history of the American Revolution, not in terms of a people determined to throw off an oppressive regime and establish a democratic nation, but in terms of class struggles (a Marxist analysis).[16]

It would be easy to write the traditional reading comprehension questions for such a passage (Who benefited from the plantation society? a) Slaves, b) Freemen, c) British Royalists, d) Plantation owners), but that is not what Wiggins does. He poses a different task for testees. They must prepare a five-minute speech supporting or refuting the proposition that this historical analysis is appropriate material to be found in the library of an American public high school. The speech will be judged on clarity, accuracy, and persuasiveness.

A reader confronted with such a task would likely do well on any test of reading comprehension: To defend something well requires intimate

knowledge of what is being defended. A person studying the passage only for a reading comprehension test, though, would likely hem and haw and stumble around trying to conduct a defense of either side of the proposition.

The second test, the authentic assessment, allows us again to see how a person can use a repertoire of knowledge and skills in a complex performance. And as with the previous example, it allows us to see knowledge used to convince others that our position is the correct one.

Tests Should Provoke Questions as well as Answers

In *Assessing Student Performance*, Grant Wiggins argues, correctly, that assessments should concentrate on the quality of students' questions:

> Too often in assessment, we worry about whether students have learned what we taught. This is sensible, of course, but such a view of assessment, taken to extremes is incompatible with the 'test' of the liberal arts. The arts that would make us free enable us to criticize sanctioned ideas, not merely re-tell what was taught.
>
> It is the astute questioner, not the technically correct answerer, who symbolizes the liberal artist. We would do well to recall a point made by the philosopher Gadamer who argued that it is the dominant opinion that threatens thinking, not ignorance. Ensuring that the student has the capacity to keep questions alive in the face of peer pressure, conventional wisdom, and the habit of our own convictions is what liberal arts must be about.
>
> We should think of our task as introducing the student to cycles of question-answer-question and not just question-answer—with the aim of a course being, in part, to make the student, not the teacher or text, the ultimate initiator of the cycle. To unendingly postpone the students' ability to ask important questions in the name of 'mastery' is to jeopardize their intellect. Good judgment and aggressive thinking will atrophy if they must incessantly be postponed while professors profess.[17]

People in the field of testing have constructed The Law of WYTIWYG: What You Test Is What You Get. So we had better test important things in meaningful ways. Consider for a moment Israel Scheffler's definition of education:

> The formation of habits of judgment and the development of character, the elevation of standards, the facilitation of understanding, the development of taste and discrimination, the stimulation of

curiosity and wondering, the fostering of style and a sense of beauty, the growth of a thirst for new ideas and visions of the yet unknown.[18]

A moment with this definition makes it abundantly clear that the current assessment system not only doesn't measure the educational outcomes we desire, it stifles them.

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CHAPTER SEVEN

CHOICE AND STANDARDS

We deal with the concept of choice here not because choice necessarily is an essential component of the system, but because some believe it represents a different approach to the issue of how to establish or ratchet-up standards. It's an approach currently popular with certain market-oriented school reformers.

Currently, only the well-off or those willing to make considerable financial sacrifice get to choose their children's schools. Wealthy people can afford the tuition for private schools. They also can exercise a more common form of choice by moving to districts with "good" schools, which are generally, though not always, located in more affluent areas.

Choice's Main Pretext and Its Inherent Problems

In simplest terms, those arguing for choice contend that if *all* parents and students, not just the affluent, are allowed to choose the schools their children attend, good schools will prosper, bad schools will perish, and the whole system will improve.

While choices are certainly to be welcomed—diversity aids survival in social as well as biological systems—there are problems with the model just limned. The reality is somewhat more complex.

Schools aren't a true "market"

For one thing, the market theory underlying the use of choice has limited application to schools. Theoretically, a true market is infinitely expandable. It is possible, in theory, to sell, say, Coca Cola to everyone.

Schools by their very structure, however, have limited potential for expansion. Some have argued that schools will "spring up" like fast food stores and gas stations where there is a market for them. But it is telling that the people who make such arguments find their analogies in institutions that use unskilled labor and pay low wages.

Schools, of course, demand people with much training and, at their best, personal attributes not found everywhere—compassion, humor, and flexibility, to name but a few.

Students, not schools, would have to compete

The limited growth available to schools would have several repercussions. First, like the American higher education system, a full-blown choice program would lead to stratification. Limited in expansion capability, colleges that attain good reputations become selective. Rather than competition among schools, there is competition among students for entry into these highly regarded institutions.

Some individuals, such as Alexander Astin of the University of California at Los Angeles, view such a trend to selectivity in public schools as bad.[1] Others, such as James Coleman of the University of Chicago, see it as positive.[2] Coleman observes that schools are already highly stratified by residence, which means they are stratified by income and ethnicity. A choice system would, in Coleman's opinion, simply shift the basis of stratification from race and money to merit.

Psychological discomfort affects placement, attrition

Given the current means of financing schools, most seats in a school are reserved for children who reside within the designated attendance area. The children who live elsewhere must therefore compete for limited space. The successful competitors will form a minority and may well feel uncomfortable in a school outside of their neighborhood. This is especially possible if they differ, as they often do, in ethnicity from the majority of the district-residing children.

The city of Richmond, Virginia, became embroiled in a controversy over its practice of "clustering" white children together in classrooms. District representatives defended the practice on the grounds that in classes with a majority of black students, the white children felt left out and overlooked. This is probably an accurate feeling on their part, and there is no reason to think that children of other ethnicities would feel any differently. Indeed, some observers have argued that many choice programs differ little from desegregating Central High School in Little Rock in 1958, except that emotions are more muted.

The psychological discomfort arising from being different from one's peers may be one of the reasons a choice program such as Milwaukee's has experienced high attrition rates[3]. Only 1 percent of Milwaukee's population can be admitted to the choice program, yet only about two-thirds of the available places have been used. Attrition was 53 percent in the first year, 35 percent in the second, and 31 percent in the third.

Since the second year's attrition rate does not differentiate between those in the program for the first time and the 35 percent who returned for a second year, the first-time attrition rate for the second-year, first-time students may actually be higher. One would expect those who had spent two years in the program to be more likely to return for a third.

The second year's attrition rate is not much higher than the rate at which lower socioeconomic students change schools annually, but choice advocates have presented choice as a power tool in school reform. In addition, the research on the Milwaukee Program found the parents to be more angry at the neighborhood school, better educated and more involved with their children's education than low-income Milwaukee parents generally. They do not appear as people who would give up on a school or program they liked.

Parent education becomes an issue

Similar results have been found in St. Louis.[4] In addition, interviews with parents in the inner city there found that they knew very little about schools other than the one located in the neighborhood and were largely uninvolved in their children's education.

Under a market theory, however, choice only works well for the consumer if the consumer has good information about the product. Given the results in St. Louis, parents there and in other locations would seem vulnerable to disingenuous hard-sell tactics in an open market.

The pattern that emerges from St. Louis and from a longer, broader study in the United Kingdom, especially Scotland, is of brighter students and children of better educated, more affluent parents leaving their previously assigned schools.[5] This, of course, leaves their former schools with a population less academically able and more difficult to work with.

Some such mobility has occurred in the well-regarded choice schools of District 4 in Manhattan. While there is little doubt that District 4—Central Park East—has vastly improved what were considered by many the worst schools in the city, some of the improvement seen in test scores has resulted not from increasing the scores of those attending, but from selecting higher scoring students.[6]

The Possible Future of Choice

The curious case of Proposition 174 may yield some insights on the future politics of choice proponents. Proposition 174, a referendum issue voted on

in California in 1993, offered parents $2,600 to use freely at schools of their choice. Although definitive words were hard to come by, one argument against the proposition was that anyone who could merely round up 25 children could start a school. One story discussed a coven of witches in Northern California who planned a school based on their own cosmology and values.

The proposition was soundly defeated 3 to 1, but it became a *cause celebre* far outside of California. The feeling is that while Proposition 174 was defeated, there is a growing acceptance of choice in less radical forms. The California Teachers Association, for example, was put in the position of supporting choice programs it had earlier opposed in order to argue that Proposition 174 was not needed.

Proposition 174 drew the attention of pundits nationwide. At least, it drew the attention of those who supported it. George Will, in a column called "Taking Back Education" vehemently espoused choice's cause.[7] In passing, Will claimed that, "Nationally, about half of urban school teachers with school-age children send their children to private schools."

Mixed message

Tracking Will's claim through a series of conservative school critics led to an unpublished paper by Denis Doyle and Terry Hartle.[8] The figure turned out to be 21 percent, not "about half." The "about half" number came from a convenient generalization of the figure, 46 percent, for Chicago public school teachers, 87 percent of whose children were in parochial schools. (A recent article has shown public school teachers sending their children to public schools at a *higher* rate than others of the same education and affluence level.)

Although Will's published number was false, it quickly made it into the popular culture as something that everyone just "knew" to be true. After my debunking of the statistic was published,[9] I sent one copy of my analysis to George Will. Will responded by sending me a transcript from a segment of "This Week With David Brinkley" in which he had confronted NEA President Keith Geiger with the statistic. Geiger responded that it was 49 percent, which was erroneous. Will thus accepted Geiger's claim over my published analysis. Oddly, Denis Doyle, responding to my analysis, was similarly charitable toward Geiger's error.[10]

Some publications perpetuated this misleading message. I sent one copy of my analysis to *The Wall Street Journal*. That paper did not publish it, but I received a letter dated September 20, 1993, from the editorial page editor

thanking me for the article "debunking George Will's column." I was rather surprised and taken aback, then, when a long lead editorial in favor of Proposition 174 in the October 25, 1993, issue of the *Journal* cited the statistic with no modification or qualification.[11] Although the text of the editorial stated that the number was only 18 percent in California, the authors chose not to observe that this figure was rather drastically lower than the 50 percent stated at the outset. Confronted about the number by *Washington Post* media-watcher, Howard Kurtz—editorial page deputy editor, Daniel Henninger, signer of the September 20 letter to me, claimed that the precise figures were less important than "that public school teachers send their children to private school at a higher rate than the general population."[12] Henninger said this in spite of a recent article that had shown public school teachers sending their children to public schools at a higher rate than others of the same education and affluence level.

The whole story of choice is not yet known because most programs have not been in place long enough to make a clear determination about what conditions are required for choice to work. Even now, though, it seems clear that choice is not the silver bullet some have hoped it would be. Harold Howe has accused market advocates of what he calls "millennial thinking," a tendency to believe that a single reform will cure all ills and bring the millennium.[13] Two comprehensive reviews of the literature by Jeffrey R. Henig and Peter W. Cookson seem to bear him out.[14,15] Both find that while the claims for choice are powerful, the evidence is quite weak. According to Henig, much of the "success stories" are casual claims with no real substance, studies with inadequate measures to demonstrate the claim, or studies so lacking in controls as to render them impossible to interpret.

Henig's analysis, the most comprehensive and readable of the three, reaches a conclusion that stands the market metaphor on its head. Where choice has worked, he claims, it has worked *not* because it has unleashed pent-up market forces, but because of those who the marketeers most malign, bureaucrats, school administrators, government agents: "The expanded use of choice . . . is better understood as having arisen from collective negotiation, public leadership and authoritative government, rather than from unleashing individual interests and market forces . . . Whether reactive or activist, in all cases the process of experimentation [with choice] has been public and political—mediated through collective institutions and made to work through the application of authoritative government action."

Henig and Cookson also observe that, although the advocates of market-driven plans paint them as All-American, the market metaphor is profoundly undemocratic: "The real danger in the market-based proposals for choice is not that they might allow some students to attend privately run schools at public expense, but that they will erode the public forums in which decisions with social consequences can democratically be resolved. Compared to other forces of socialization—the family, religion, and mass media—schools are more open to public scrutiny and democratic intervention."

It also seems clear that more will be heard about choice. The Protestant Christian right has argued strongly for choice and no doubt will continue to do so. In the theology of this group, the only legitimate institutions are the church, the state, and the family. Schooling is the domain of the family, and families should have power over it. Families should, therefore, have the right to choose what kinds of schooling their children receive and where.

In their push for vouchers to assist them in choice, the Protestants occasionally have picked up strange bedfellows as allies, including the Catholic Church. One of the latter's members, former U.S. Secretary of Education William Bennett, stumped long and hard for Proposition 174.

Bennett also is affiliated with one of two largely secular, Republican organizations lobbying for vouchers and choice, Americans for School Choice and Empower America. How far these organizations can push their program remains a question, however. Some observers argue that Republicans are largely happy with their schools, having exercised choice by where they bought their homes. They don't think that the perceived education crisis affects them personally.

According to John J. Miller of the Center for the New American Community, "School Choice actually has a narrow and fragile constituency: conservative ideologues, the urban poor, and parents with children already enrolled in private schools."[16] Whether this coalition can succeed in pushing coice is still an open question.

It is conceivable that some people could be convinced to vote for choice because they think it will help other people. The annual *Phi Delta Kappan*/Gallup poll has found that in the last decade, the public's opinion of local schools has risen while their outlook on the nation's schools has become more gloomy.[17] It is thus at least theoretically possible that people could vote for choice or other school-related issues to solve some problem "out there." In any case, choice issues will be around for a while.

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CHAPTER EIGHT

FUNDING THE SYSTEM

If we wish to take a systems approach and to focus our vision at the national level, we can immediately see that some parts of the system are well-funded and some parts can hardly make ends meet. We see, too, that school finance is an area in disarray.

Equity: A Complex Issue

Most people agree that funding formulas are not equitable now, but they cannot agree on what changes to make. To date, some 25 states have had their funding schemes challenged in court, and 11 funding formulas have been tossed out on constitutional grounds. In 1993, the Minnesota Supreme Court upheld a property tax-based funding system, concluding that the state constitution does not require an "identical" education for all students as long as the education of all students is "adequate." The report on this decision did not define "adequate."

In Michigan, teachers filed suit to have the courts take over school funding. Michigan Governor John Engler signed into law a bill that wiped out $6 billion in property taxes for schools. In a spring 1994, referendum voters chose a collection of sales taxes as an alternative. At press time, the details of the program were yet to be determined.

Property taxes aren't the answer

Schools receive funds from states through a variety of formulas. Most are sufficiently complex that very few people understand them. Nor can many predict the outcomes of tinkering with them.

Besides the money sent from the state, a school district receives a percentage of property taxes collected in the district. As long as the system is based on property taxes, there will never be equitable distribution of funds. This is so, even if some states, such as Minnesota, hold that inequitable distributions are nonetheless constitutional. Some form of progressive income tax or consumption tax is required. And in all likelihood, the state should function as the unit of the education funding system that determines how such monies should be allocated to the districts.

Equal would not necessarily be equitable

The greatest single portion of even the most administratively bloated

district is by far that allotted for teacher salaries. Teachers weigh the advantages of teaching in a particular type of district against the allure of other aspects of the location. Thus, it may be necessary for the districts who can least afford it under the present funding system to offer higher salaries in order to attract their share of highly qualified instructors. (An alternative that is becoming cheaper and more powerful is to use information technology to deliver instruction from remote sites.)

Needed First: A Better Understanding of Funding

Before we can really address the issue of equity, however, we need to get a grip on the reality of what is currently being spent on education and the impact of school funding on equity. We also must agree on how important money is to education reform, and how much is enough or too much.

United States is not a big spender

Critics of the system allege that the United States spends more money on education than any other country. As David Berliner of Arizona State University observes, former U.S. Assistant Secretary of Education Chester E. Finn, Jr., former U.S. Secretary of Education Lauro Cavazos, former head of the Council of Economic Advisers Michael Boskin, former chief of staff John Sununu, and President Bush all have made such statements to the media.[1] Berliner notes that he has been unable to find any sources for such comments and, while he hesitates to call such a statement "a whopper," he does "not believe that anything like reliable information existed at the time to support those statements."

The statements *might* be true if spending for colleges is included. While many countries spend more per pupil than the United States, over 58 percent of U.S. high school graduates attend some form of higher education. Another 10 percent attend postsecondary vocational or technical schools. This is far more than any other nation and triple the rate of many European nations.

Expenditures reported only in per-pupil costs also make it appear that the United States spends a lot on its system. The amount is second only to Canada. However, when costs are cast in terms of the Gross Domestic Product, America trails many other nations. Calculations by the U.S. Department of Education in the 1992 Condition of Education show the United States finishing eleventh of 22 nations in K-12 per capita expenditures. For

college expenditures, the United States finishes eighteenth.[2] A similar calculation by OECD for those 19 nations found the United States 9th.[3]

Costs have risen only modestly

The costs of education have risen only modestly, when the costs of special education are factored out. The Sandia engineers concluded that the cost of $1,600 per pupil per year in 1960 had risen only to $2,500 in 1988, when a more realistic estimate than usual was made of special education costs.

Usually, special education costs are figured only as an "add on," but the Sandia group attempted to obtain figures for such things as overhead. Special education costs are real, of course, with some 12 percent of students nationally receiving services. But it is not the case that we are "throwing money" at schools.

Money *does* affect achievement

Some conservative critics of schools contend that money is of little import, that it has no impact on achievement or the productivity of schools. We should not, they argue, "throw money at the problem." Eric Hanushek, for example, conducted the best known analysis of the relationship between money and outcomes and claimed to find no relationship.[4]

More recent analyses, however, have indicated that money does matter. A second look at Hanushek's data by Keith Baker showed it to actually favor a "money matters" conclusion. Hanushek did not ask the right question nor test his hypothesis properly.

Hanushek looked at the level of achievement. If one looks at changes in achievement with increases in money, the relationship clearly is present. But Hanushek did not perform the proper analysis to reach the conclusions drawn in his review of 65 studies. The studies are cast only in terms of statistical significance.[5]

The question asked is, "Did more money lead to more achievement?" Statistical significance tests cannot answer this question. They cannot determine if treatment #1 produced more gain than treatment #2 (although such tests are often misused in this way). Statistical significance tells you one thing and one thing only: how likely it is that the difference you found could occur by chance if the two samples actually came from populations with the same mean (zero difference). Nothing more, nothing less. Baker's analysis

of Hanushek's data, cast simply in terms of their direction, finds 38 with a positive relationship and only 16 with a negative relationship.

In the April 1994 *Educational Researcher*, Larry Hedges and colleagues from the University of Chicago took another look at precisely the same array of studies that Hanushek had used.[5] Hanushek had analyzed the data with a relatively primitive "vote counting" method. Hedges and colleagues use a much more powerful version of meta-analysis. By this technique, Hedges et al find that adding only $500 would increase achievement by an effect size of .7. This is an enormous impact. An effect size of .7 is the equivalent of taking a student at the 50th percentile and moving him or her to the 76th. Hanushek thinks this effect size is unrealistic and the issues probably are not resolved in terms of exact amounts, but it appears clear that money matters.

A recent study conducted by the American Legislative Exchange Committee, under the oversight of former U.S. Secretary of Education William Bennett, also claimed to find no systematic relationship between money and achievement.[7] Achievement this time was measured in terms of state averages on the SAT compared with their per-pupil expenditures.

Syndicated columnist George Will noted that the five leading states (Iowa, North Dakota, South Dakota, Utah, and Minnesota) were all low spenders; while New Jersey, which spends more per pupil per year than any other state, finished only thirty-ninth in the Great SAT Race.[8] What Will did not mention, of course, was that in the five top states, virtually no one takes the SAT. The percentages for the states in 1993 were 5, 6, 5, 4, and 11, respectively. In contrast, in lowly New Jersey, fully 76 percent of the seniors huddled in angst on Saturday mornings to bubble in answer sheets. (Students in the top SAT states mostly take the ACT battery.)

Some nations recognize that money matters or at least act as if it does. Iris Rotberg has observed that in some countries, where the federal government controls resource allocations, poor districts receive much more money than rich districts.[9]

In Sweden, for example, per-pupil expenditures in low-income schools are two to three times higher than in affluent schools. Such disparities occur in the United States also, but it is the rich districts that typically spend the most money. The 100 poorest districts in Texas spend an average of just under $3,000 per student. The 100 wealthiest districts spend about $7,200 per pupil. In Illinois, school district spending varies roughly between $2,400 and $8,300 per student.

As for the claim that throwing money at the problem is useless, Rotberg comments that, "this is true only if one assumes that offering poor children the opportunities routinely available to their more affluent peers is the same as throwing money at a problem. Teacher expertise and experience, class sizes, better science laboratories, and decent facilities do matter. If they don't, rich school districts haven't heard the message."

Intensive Care Needed for the Most Disadvantaged

While the relationship between money and achievement is positive, the proper relationship between money and achievement is negative. It is negative for the same reason that the relationship between expense and survival rates in hospitals is negative: Those conditions requiring the greatest expenditures still have the least favorable outcomes.

Who would think that, with identical funding, an inner-city school would attain the same level of achievement as a suburban school? Bella Rosenberg of the American Federation of Teachers has commented that we ought to treat inner-city schools as Intensive Care Units with all of the special attention, expertise, and equipment that implies.

Jonathan Kozol, in his book *Savage Inequalities*[10] describes inequities that most assuredly contribute to performance deficits. Clearly, such schools are in dire need of resources. Yet an analysis by the Council of Great City Schools showed that, on average, cities receive $900 less per pupil per year than nonurban areas.[11]

Of course, it is not just the cities that are in trouble. The Population Reference Bureau[12] concluded that the United States has a rural underclass about half the size of the urban underclass, but where problems are even more intractable. The rural poor are seldom seen because they are dispersed across the countryside and can't organize to demonstrate before television cameras, most of which are in cities anyway.

One story about this rural underclass told of districts in Michigan and Indiana sending obsolete textbooks to Alabama and Mississippi where they were received as "godsends." The Midwest districts also sent desks and chairs since there weren't enough of those to go around either. A recent article on trends in the Mississippi Delta spoke of emerging towns that have lost almost all of their property tax base. "We have 1,476 people, but we may have 100 who actually work," said the former mayor of Jonestown.[13] And in a report on the condition of Alabama schools carried on the December

1993 edition of National Public Radio's "All Things Considered," an Alabama historian observed that some science textbooks in Alabama declare that "man may some day walk on the moon."

The results of such fiscal neglect are all too obvious: Simply remember the effects of poverty on student achievement noted in chapter 2.

The Washington, D.C., public schools give us a specific example. Though this district is a frequent target of criticism, it never has been labeled the worst in the nation. Yet only 60 percent of the students graduate. Only about 25 percent of these take the SAT (compared to upwards of 80 percent of students in the surrounding suburbs).[14] The average total SAT for 1992 was 705. If we assume that those taking the SAT are academically the brightest and most highly motivated, then the average District of Columbia SAT test-taker barely qualifies to play freshman varsity athletics. (The NCAA's Proposition 48 requires a combined SAT total of 700 for freshman eligibility.)

Commitment to the long run

The funding inequities and their consequences described in this section are hardly revelatory. Without a significant paradigm shift, though, it is unlikely that they will be dealt with properly. One explanation for the neglect comes in the terms of John Kenneth Galbraith's "culture of contentment"[15]:

> If poor schools received more money, those who pay taxes would have to pay more. Thus, good schools in cities and poor rural areas cost "us" and benefit "them," at least in the short run, and is therefore something to be avoided. In the long run, however, the situation is different.

To change our education system, Americans must take up the habit of looking at social problems and their solutions in the long run.

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CHAPTER NINE

THE PURPOSE OF THE SYSTEM AND ITS GOALS

To this point, this treatise has stressed the need for a systems approach—the need to look at and fund the whole system—without defining the system. It has mentioned Israel Scheffler's definition of education, but has not really discussed what the system is supposed to accomplish: What *are* the aims of education? And more broadly, of society through education?

Unlike many systems, the American educational system was never laid out with a grand, single-minded plan. Quite the reverse. In many cases, parts of the system changed function, other parts were grafted on, and some just "growed like Topsy." We have been better at specifying in general the benefits expected near the end of the high school and college components than in the early school years, but a systems approach requires us to decide what we want at each level. It requires benchmarks, as discussed in Chapter 6.

In that chapter, it was proposed that quality be specified in terms of the next level of consumer of the system's "product." But these would be rather technical specifications in terms of competence, skills, and knowledge (such as what a freshman student has to be able to do to get a "B" on an English paper). They do not address overall purpose.

Philosophical Barriers To Defining Education's Purpose

It is possible that we cannot speak with a single voice on the nature of purpose. Aristotle, after all, argued that education addressed "the good life" and, since people will have different and irreconcilable ideas about what the good life means, this inevitably places education in the political realm, perhaps with irreconcilable differences among actors.

For example, most calls for reform have included a "critical thinking" component early in the curriculum. But some Christian fundamentalists oppose such teachings before age 16. It is not just that they have serious objections to the presence of certain creatures — witches, for example—even appearing in curricular materials, where more secular groups would not take such appearances seriously. The shift to learner outcomes implicit or explicit in many critical thinking programs is an intolerable shift to some. It shifts the emphasis from teaching, which is the proper instillation of absolute knowledge and values, to individually constructed learning, an inappropriate shift toward relativism.

In Pennsylvania, a program of "Outcome-Based Education" (OBE) was substantially modified after sustained attacks from religious groups who held that some of the outcomes invaded the realm of values that should be left to the family. Although the critiques of a similar proposed program in Virginia were couched largely in terms of the costs, clearly a similar concern with values undergirded the critics' comments. Pressure from critics in Virginia caused then-Governor Wilder to abandon the OBE-formulated Common Core of Learning. Attacks on OBE have arisen in other states, and more can be expected. According to Fritz Detwiler, the Protestant Right has declared, in their words, civil cultural war on the larger society.[1]

Similarly, while the earlier definition of education from Scheffler includes the development of character, some would argue that character development is not proper for schools. This argument is understandable but misguided. One aim of education is to prepare students to participate in a democratic society. The education for such must include shaping dispositions to act in accordance with democratic principles.

This is quite a different education than one to prepare a person to participate in a totalitarian society. In totalitarian states, thinking critically or questioning values is not only not rewarded, it can be punished by jail or death. In a democratic society, on the other hand, one must be able to decide among a variety of claims, all competing as "the truth."

Definitions of Years Past

It is worthwhile to take a look at the advantages of education, as enumerated by Benjamin Rush, an educator and political commentator and signer of the Declaration of Independence. In 1786, Rush had this to say:

- It (education) is friendly to religion inasmuch as it assists in removing prejudice and superstition.
- It is favorable to liberty. Freedom can exist only in a society of knowledge.
- It promotes just ideas of law and government.
- It is friendly to manners. Learning in all countries promotes civilization, and the pleasures of society and conversation.
- It promotes agriculture, the great basis of national wealth and happiness.
- Manufacturers of all kinds owe their perfection chiefly to learning.[2]

A hundred years later, John Dewey asserted that education "is the fundamental method of social progress and reform."[3] He believed any reforms that

"rest simply upon enactment of law. . . are transitory and futile." Education must regulate the relationship between the individual and "the social consciousness. . . in the ideal school, we have the reconciliation of the individualistic and the institutional ideals."

The Need To Go Beyond Knowledge

Grant Wiggins has argued the effects of education on democracy and social progress from a similar perspective. He challenges us to stop treating students as passive receptacles (and many who give lip service to a constructivist approach to learning actually do). If we treat students instead as "intellectual apprentices," we could ultimately develop in them not just knowledge and skills and how to use them, but a "style."

To see the word style in the context of education will likely surprise many, but it shouldn't. Ultimately it is what we like and respect most about other people. Would we pay to hear a pianist who had no style? Music without style is Muzak! Learning and the life of the intellect also can be approached with style.

Optimization of learning must be the overriding goal

For the purposes of this report, we can agree that the goal of school is to optimize learning—whatever it is determined that students should learn. That "whatever" will likely have to be left, at least in part, to local decision makers. As William H. Clune of the University of Wisconsin has stressed, the country is far too diverse to do otherwise.[4]

However, to say that the goal of the system is to optimize learning for *all* students is to radically change the system's goals from what they have been historically.

American schools have not always been expected to teach a lot to everyone. Until recently, for most people in the country, a strong back or a deft hand was sufficient to ensure, if not wealth, a decent standard of living in a manufacturing society built around the assembly line. The rapid repetition of small tasks was then the hallmark of efficiency.

Schools that prepared the bulk of Americans for such jobs while sending an elite on to higher education were sufficient to ensure both a supply of laborers and managers, and generally, to keep the country prospering.

The American school, in essence, was, as it's been called, "the great sorting

machine." It served as a device for deciding who gets society's greatest rewards, and it mostly benefitted white males.

Current goals focus is limited to jobs, competition

In the decade since "A Nation at Risk," the discussion of goals and purposes has been debased by a dreary instrumentality. Most discussions start and stop with contentions about only two of education's purposes, seen as co-equal:

1. Securing good jobs for individuals; and
2. Securing international competitiveness for the nation.

Diane Brady, an associate editor at the Canadian magazine, *MacLean's*, writing in the September/October 1993 issue of *Mother Jones*, caught well the thrust of an argument that has been espoused by people as diverse as Lamar Alexander, Lauren Resnick, Albert Shanker, the SCANS Commission and, really, a host of others:

> For years, Americans have complained that Johnny can't read. In the booming postwar economy, it didn't seem to matter. . . . It didn't matter what he learned, so long as Johnny could get a job and buy a house in the suburbs. . .
>
> The good life will be harder to achieve in the coming century. Today's schools actually may be no worse than those of 20—or 50—years ago. Nonetheless, they aren't good enough. American students need to be better educated if they are to compete in the global arena.[5]

As historical analysis, Brady's treatise is simplistic. The relationship between the education of the entire populace and international competition has yet to be documented. But it is important—as we seek to prepare the workers of tomorrow and set related goals—to understand the changes in the workforce.

According to Lawrence Mishel and Ruy Texeira in *The Myth of the Coming Labor Shortage*, there's been a shift toward a more skilled workforce for about three decades. And while this shift is slowing rather than accelerating, it continues nevertheless.[6] While 75 percent of American labor remains organized around simple repetitive tasks, the more productive and competitive corporations have pushed complexity and decision making down to the lowest possible point. They have made work "smart" and increased the skill levels for even the lowest jobs.

Thus, while schools formerly could be considered successes by providing most people with "basic skills," the typical skills considered previously as

minimal are, in many instances, no longer even that. Since "A Nation at Risk," the country has come to expect schools to provide students with skills that will permit them to succeed at these more complicated jobs.

Trend is toward service-sector jobs

The perceived need for increasingly skilled labor has been used to increase the focus on learners in schools (as opposed to on-the-job training). At the same time, it must be pointed out that, while business and industry assert they need more skilled labor to increase productivity in some jobs, the trend in recent years has been toward producing more and more low-paying, service-sector jobs and eliminating better-paying manufacturing jobs.

While the fastest growing jobs in terms of *rates* of increase all involve skilled labor, these jobs account for a tiny fraction of all jobs. By one estimate, the top 10 fastest growing jobs requiring skilled labor account for only 4 percent of the total labor force. On the other hand, the largest three job categories and fastest growing in terms of *numbers* account for many more jobs: janitor-maid, waiter-waitress, and sales clerk. In 1992, as manufacturing shed 255,000 jobs, the restaurant industry alone added 249,000.

By 2000, the three fastest growing jobs (paralegal, medical assistant, radiologic technician) in terms of rates will account for a projected 616,000 jobs.[7,8] The three low-paying categories accounting for the most jobs, however, will account for 10,351,000. Tourism is America's largest growing industry, but it does not offer many high-skilled or high-wage opportunities.

In sum, we need to realize there are limits as to how many skilled employees the labor force can absorb. High school dropouts, high school graduates, and those with one or more years of college education are all more likely to be working for low wages than 15 years ago (low wages being defined as $12,000 a year or under in 1991). The number of students with college degrees who are working in jobs that require no college continues to increase, with estimates ranging from 18 to 30 percent. Demographer Harold Hodgkinson discovered that 35 percent of the students in one community college already owned bachelor's degrees and were now looking for more practical skills.

During the NAFTA debates, Ross Perot kept wondering why the people who carried his bags at hotels all had college degrees. The "B.A.-bellboy phenomenon" was grist for several articles. In one, a college graduate was reported as saying, "We're getting jobs chimps could do." The lucky ones,

claimed the article, were getting positions offering such challenging activities as photocopying.[9]

Education will continue to affect wages. This large number of college students looking for jobs and taking menial ones does not mean that the value of education is declining. Quite the contrary. The percentage of people holding low-paying jobs has risen most rapidly among high school dropouts. More importantly, the wage gap between those in low- and high-paying jobs—which require more education—has increased.

A study by Princeton economists Orley Ashenfelter and David Krueger of identical twins who had different amounts of education found that each year of education added about 16 percent annual income.[10] That is, if one of the twins had a high school diploma and the other a baccalaureate degree, the college grad would earn on average 64 percent more per year.

A chart in the February 3, 1993, issue of *Education Week* painted an even more dramatic picture. The chart did not control for genetics, but it showed that in 1990: A high school graduate earned $1,077 a month; a person with an associate degree garnered $1,672; a college grad, $2,116; a person with a master's, $2,822; and a person with a doctorate, $3,855. High school dropouts drew a meager $492.[11]

Learning also should be a goal in itself

The push for more education for all citizens is not only job-related. Society as a whole has recognized that education brings benefits other than increased skills and the salaries they command. Educated people live longer, healthier lives and may even be happier, though the nature of happiness remains elusive. In any case, one way to keep life from being nasty, brutal, and short is through schooling.

Society also has come to value, at least with lip-service, the idea and ideal of lifelong learning. In part, the growth of life-learners—people constantly renewing themselves with new information, new skills, and new perspectives—has become a societal goal, valuable in and of itself. Some years ago, examining trends in literacy expectations, historian Daniel Resnick and cognitive psychologist Lauren Resnick effectively documented the historical shift from a society expecting low literacy for many and high literacy for a few to a society expecting high literacy for all.[12]

Literacy and skills are needed for both personal and professional survival. In many professions, the needed skills change rapidly. The half-life of much

knowledge is now only a few years. More and more industries are moving in the direction of re-skilling people often. A person who has one set of skills and is unwilling, or unable, to learn new ones may well find himself rapidly becoming obsolete and unneeded. While many have put forth the argument for a more highly skilled workforce, the most important quality in a worker—and a citizen—may well be flexibility.

In the summer of 1993, an educational conference in Toronto provided an eye-popping experience. There, people were speaking of education in the terms used by Jefferson, Rush, Dewey, and Scheffler. Some even dared speak of education as a pursuit of truth.

It is hoped that, as we begin anew to define the goals and purposes of education, we think beyond its economic consequences for individuals and nations.

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CHAPTER TEN

CHANGES IN LEARNERS: IMPACT ON THE SYSTEM

Students who attend school today differ in many ways from those of previous generations. Although they learn in the same ways, using the same psychological processes, their capacity for learning and their style of learning are affected by a variety of influences—some of them good, some of them bad.

Seymour Papert has argued that a doctor from 1894 would literally be lost in a hospital of today—computers and technology have so revolutionized medicine.[1] He also contends that a teacher from a century back would feel right at home in today's classroom. That might be true of its physical nature. But a good guess is that a post-Victorian teacher would last about 10 minutes with today's children.

The field of educational demographics permits us to examine the demographic characteristics of the learners entering the system and, thus, attempt to predict what kinds of pressures they will put on the system, as well as what kinds of changes they may require of it. In Chapter 2, we discussed some of the economic and societal issues that are undermining today's graduates. These included poverty, lack of immunizations, low birth weight, single parenting, and crime. And it appears that these concerns are only getting worse. For the class of 2010, those children born in 1992, for example, we know that 23 percent were born in poverty and 50 percent were born to a single parent. But other factors affect the nature of learners that school systems must address. One of the most prominent ones, perhaps, is a growing diversity.

We Are Less of a "Melting Pot" Than Ever

Americans have always characterized themselves as a nation of immigrants, although they have sometimes been naive in evaluating what happens to immigrants once they reach these shores. The "melting pot" did not, of course, homogenize them in the fashion once claimed by early sociologists. More recently, some have come to realize that poems and slogans of 70-odd years ago that characterized the United States as a "nation of nations" really should have portrayed the country as a nation of Europeans plus two oppressed minority groups.

Harold Hodgkinson is fond of noting that if "Anglos" went to a concert of these earlier immigrants' music, they would recognize it as their own. If

Anglos were to go to a concert of the music of the new immigrants, however, it would stretch their range of accommodation to understand what was going on. The tonal systems, the rhythms, the harmonies are different and unfamiliar.

The question arises as to whether America's new immigrants will be able to, or will wish to, follow the path of the earlier Europeans, which led to their moving up both the economic and educational ladders. In any case, these students will put additional stresses on the educational system, if for no other reasons than that many of them come from poorly educated families and do not speak English as a native language. (In four of the nation's most populous states—California, Florida, New York, and Texas—32 percent, 17 percent, 23 percent, and 25 percent of the population, respectively, speak a language other than English at home.

The stresses described above will require more resources, both money and time. But this requirement will be borne by an aging population. In 1970, 34 percent of the population was under 18; in 1990, only 26 percent were this young. By 2000, this figure will fall to 25 percent. We already spend $11,000 a year on each person over the age of 65, and only $4,250 annually on everyone under the age of 18.[2] According to Hodgkinson, all groups vote their interest. Children, of course, do not vote, so it will become even more difficult to get the resources to meet their needs.

Children Are Less Ready

Nowhere does the change in constituents show up more dramatically than in the preschool years. The disadvantage experienced by disadvantaged children begins immediately, starting with the lack of prenatal care and immunizations noted in Chapter 2. In addition, poor children are more likely to be exposed to a variety of environmental hazards such as leaded water, as well as to the consequences of poor nutrition.

This flies in the face of America's first National Education Goal—that all children will arrive at school ready to learn. In fact, Ernest Boyer, in *Ready To Learn*, found that 42 percent of all kindergarten teachers believe children today are less ready for school than even those of five years ago. Only 25 percent said children were more ready.[3]

Since Boyer's analysis does not dissect the responses by socioeconomic differences among the students of teachers giving different responses, one can guess that those saying "more ready" had in mind more affluent students

than did those saying "less ready." Among those teachers saying children are less ready, however, language deficiencies were the most commonly reported problem. It's worth noting that overwhelmingly, these same teachers said that parent education would do the most for children's readiness.

Day care, preschool insufficient

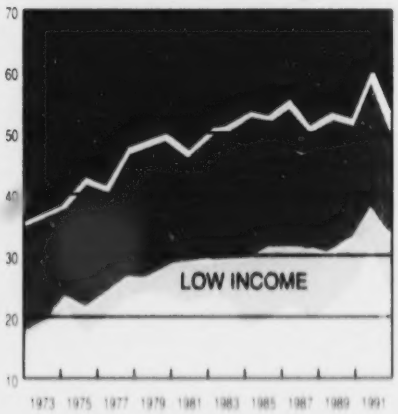
Of course, readiness is greatly affected by the care and attention children receive early on—which, for many (especially the poor) isn't adequate. There is Head Start for poor children, but it has never received full funding.

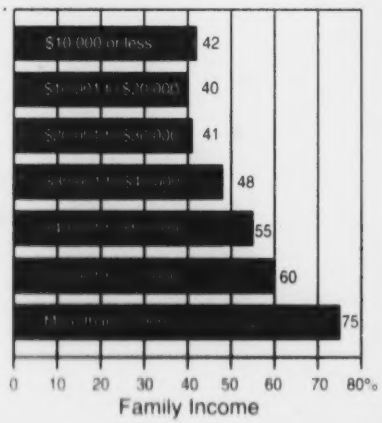
According to Boyer, only about 40 percent of children whose families earn less than $40,000 attend preschool. *The Condition of Education 1993* shows about 22 percent of low-income families enroll their children in preschool, compared to 30 percent of middle income families, and 53 percent of high-income families (see Figure 10-A).

FIGURE 10-A

Our Readiness Goal Eludes Us

The first National Education Goal is to have all children arrive at school ready to learn. The preschool enrollment patterns, however, suggest that we are moving farther away from that goal. High-income families are much more likely to enroll their children in preschool than are middle- and low-income families. In addition, programs offered at high income preschools focus on cognitive development, while those offered at low income preschools often are more custodial.





Source: *Education Week*, Sept. 22, 1993

These percentages do not address the issue of what is going on in the various preschools. We can surmise, though, that children of low income families are more likely to receive custodial care than care that develops social and intellectual skills. A friend related how a clerical worker in his office reported that his daughter was having trouble sleeping at night. In conversation, the parent revealed that the woman who ran the day-care center his child attended kept the house dark and encouraged the children to be quiet and still, even to sleep. Not exactly a recipe to enrich a growing brain.

The opening paragraph of Boyer's *Ready To Learn* reads as follows:

> America is losing sight of its children. In decisions made every day, we are placing them at the very bottom of the agenda, with grave consequences for the future of the nation. It's simply intolerable that millions of children in this country are physically and emotionally disadvantaged in ways that restrict their capacity to learn, especially when we know what a terrible price will be paid for such neglect, not just educationally, but in tragic human terms as well.

But of course, it is tolerable in the sense that we tolerate it and do little to nothing about it. The 1971 White House Conference on Children declared that child care was one of the most pressing problems in the nation, but scant progress has been made in addressing it.

Comprehensive approach needed

Many people have acknowledged that not only should we provide more care for children, but that we should package this care in a comprehensive program. Boyer observes this in *Ready To Learn*, as do documents of the Child Care Action Campaign.

A comprehensive approach to child care could generate many benefits of which better care is only one. A comprehensive approach could make better care available more efficiently and more effectively than what Boyer calls our current "chaotic nonsystem." In addition, a consolidation of child care provisions would articulate the preschool years with the kindergarten and elementary years. Accomplishing such a consolidation will not be easy and will have to take place at many levels.

Of such a consolidation, Michael Kirst writes that:

> The attempt to improve the current nonsystem must proceed from a grasp of the deeply rooted causes of its fragmentation. Problems start with splintered professional preparation on the university campus.

> Educators go to education schools, social workers to social welfare schools, health professionals to schools of medicine or public health, juvenile justice workers to criminology schools, county executives to public administration schools, and so on. There is rarely any interprofessional education or contact during the staff development programs of a professional's career. Different children's service systems have separate intake and assessments procedures and information systems that cannot be aggregated.[4]

Neither Boyer nor Kirst directly address one important reason for an improved child care system: the disappearance and disarray of parents. Teachers increasingly report that parents are so consumed with holding their own lives together that they lack the requisite time, energy, and understanding to help their children grow.

Quality care as an investment

The provision of quality day care and other child social services should be seen as an investment, not an expenditure. Shortly after being elected, President Clinton was heard to say on several occasions that we get three dollars back for every dollar invested in day care. Later he stopped making this utterance, probably because staffers told him that the figure came from only one unreplicated study, the well-known Perry Preschool Project in Ypsilanti, Michigan.

While it is true that this study has not been replicated, other studies suggest that the results are replicable. The payback, as recently calculated for the children, now age 27, is not $3, but $7.16.[5] Also:

- The group that did not attend preschool was five times more likely to have five or more arrests, and one-fourth as likely to make over $2,000 a month.
- More than twice as many of those who had attended preschool owned their own home.
- Fewer in the preschool group had ever been on social services. Seventy-one percent had graduated from high school, compared to 54 percent of the control group. (Readers should recall that students in the study were randomly assigned to experimental and control groups, a procedure that minimizes the chance that the two groups started with cognitive differences.)

Some might argue that the Perry Project stands out in comparison to other program disappointments that led Arthur Jensen to his famous comment, "Compensatory education has been tried, and it apparently has failed."[6] The operative word in Jensen's pronouncement, however, may well be "apparently."

On the other hand, W. Steven Barnett of Rutgers University reviewed a series of studies examining the long-term impact of preschool and found them largely positive.[7] IQ gains, always seen initially, do seem to fade over time, but other outcomes such as grade retention, special education placement, and graduation rates favored preschoolers.

Barnett also found that many studies did not match experimental and control groups properly in testing programs. As the children progressed through the year, the control group came to contain more and more retained children. Although such children score low, they score better the second time around. Had the experimental groups been tested only with age mates, they would have scored higher on achievement tests.

Children suffering neglect today will be expected to be taxpayers, social security contributors, and even our civic leaders 25 years from now. Is that a reasonable expectation?

The evidence seems to support Barnett's contention that a $14 billion investment could purchase the nation a preschool program as good as the Perry project. The consequent lack of attention to children's development is thus not understandable and will doubtless come back to haunt us.

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CHAPTER ELEVEN

WIRING THE SYSTEM

According to philosopher Michael Heim, the computer *already* has had as much of an impact on most of society as Gutenberg's printing press.[1] Unfortunately, the information technology revolution that has so changed the world outside of education has made only modest inroads inside the schoolhouse.

The Myth of the Technological Revolution

Indeed, the historical relationship between technology and the schools has been tenuous and uneasy, full of unrealized promise. Over the last century, many visionaries have promised a revolution in learning as a result of changes in technology. But the revolution never came. Beginning with educational radio, through film, educational television, videotape, and B.F. Skinner's teaching machines, the new technologies have made brief appearances in selected sites, after which many teachers relegated the various machines to secondary roles or the closet. Even in 1991, Henry Becker of the University of California found that most teachers who used computers were still using them as ancillary devices, supplementing the core of the curriculum, often with drill-and-practice exercises. Only a small proportion of teachers had integrated the machine into the central parts of instruction.

A question of control

The older "technologies" maintained the traditional situation in which the teacher controlled the information. This approach, while probably never optimal, was at least satisfactory during days past when knowledge was scarce and had to be sought out. It is easy to see how, in eras of less than immediate information exchange, schools and colleges earned their positions as places from which knowledge was dispensed by the few who had it, to the many who did not.

In the late 1970s, with the advent of the Apple II, Tandy TRS-80, and Commodore PET computers (the first of the machines to be called "personal" computers), the condition of knowledge-as-scarce-resource began to change. The control of the flow of knowledge began to pass to the learner. In the hyper-swiftly changing world of information technology, these machines are now dinosaurs.

The Apple II had the largest brain of the three, a memory of 16,000 bytes, expandable to 64,000, and no storage. Machines today that sell for half what the Apple II cost come with 4 million bytes of memory. Plus many are equipped with 300 to 400 million bytes of storage, necessary because the memory needed for complex word processing, spreadsheet, data base, and graphics programs take several million bytes each. Actually, "snail" is a more appropriate metaphor for the early computers than dinosaur. Not only did these machines have small brains, they were, compared to current computers, incredibly slow.

The educationally critical aspect of the new computers is not, however, their memory or their speed. It is that they permit the user to interact with the machine. This is even more evident in dramatic technologies such as interactive videodisc. Children, despite often being characterized as couch potatoes addicted to television, do not like to be passive. Children's television entertainer Shari Lewis, for example, has found that she gets better involvement when she has her puppet, Lambchop, perform a routine that requires that the children sing and act along with it. This, of course, is precisely what cognitive psychological theory would predict.

Barriers to the Use of Computers in Schools

Schools have been slow to adopt the new technologies for a variety of reasons. In addition to skepticism arising from earlier techno-follies, cost has been a major factor, ignorance another. Even during the early days of personal computers, one person commented that what educators were doing with these machines was like asking a symphony to play scales. Given the power of contemporary machines, it is more like assembling the forces needed for a Mahler's "Symphony of a Thousand" and repeating only a single note.

Administrators not plugged in

Many of those in a position to purchase computers did not realize their potential. It is not uncommon today to find high-powered machines in the offices of senior school administrators—with the power off. This generation did not grow up with computers and they feel they cannot take the time off from their frenetic schedules to learn about them.

In the offices of these administrators, the secretaries are usually competent with word processing procedures. Some can use spreadsheet programs, and

a few can operate data base and graphics packages. These, for all the tremendously increased speed and power they offer, do not reveal to the administrators the full range of computer uses.

Indeed, many administrators see only the end products of the process, which often resemble merely more professional-looking versions of the old product. Not seeing what computers can do, this generation of administrators is not in a position to advocate their use. This may be why, in the early days of personal computers, they were most often introduced to school systems by individual teachers who were computer "buffs."

Cold feet, trepidation was norm

Computers' advance into the classroom was slowed for another reason: fear. From the early days of computer-assisted instruction, researchers such as Patrick Suppes spoke of using the computer to provide every child with a wise Socratic interrogator. More than other technologies, computers were touted in some quarters as replacements for teachers. Little wonder that they made teachers apprehensive. Recent studies have shown that only after some years of computer use do teachers become comfortable with the machines and feel that they "at least know as much about the machine as the kids."

Then, too, early computers were not especially "user friendly" and little help was available to those who ventured into the field. Computer wizards, supposedly there to help, often assumed people not intimated with the machines knew more than they actually did—or they would baffle them with dialogue peppered with techno-jargon. In addition, people who wanted to write their own software usually had to cope with BASIC, a weak and cumbersome language, never intended for widespread popular use.

Impact of the barriers

This fear and anxiety set up a somewhat vicious cycle: Because educators used computers tentatively, software manufacturers would not risk large investments to develop the kinds of powerful software packages that they brought out for business use. Because the software was not always of high quality, schools were slow to acquire it.

In addition, because computers often entered schools through the agency of some lone "computer buff" who cajoled the school or, less likely, the school district, into acquiring machines, computer use and setup was disjointed.

The computers often ended up causing more problems than they solved, not to mention embarrassment.

Happily, now it is more likely that a principal or a committee will act on behalf of a school or district. As Henry Becker has found, contrary to most areas of change where top-down control is ineffective, such centralized planning for computer use works better than grass roots, bottom-up acquisitions.[2]

Benefits of Use Beginning To Be Realized

Becker also has found that computer use is changing, if slowly, and benefits are accruing as some teachers do deploy the machines as integral parts of their instruction. One recent report showed that with computers applied to administrative tasks, teachers saved an average of 36 minutes a day, a savings that amounts to tacking on three weeks to the school year.

A number of studies have found that students using computers learn more and enjoy the experience. Indeed, the affective benefits of computers have often outweighed the achievement benefits. As one would expect from the tenets of cognitive psychology, students appreciate being able to move through material at their own pace, and to make mistakes without feeling censured by the teacher or classmates.

Possibilities beyond computers

As noted, new generations of technology usher in new possibilities. Indeed, the *quantitative* changes in productivity discussed above, while certainly welcome, pale in significance compared to the *qualitative* changes the computer introduces into the process of schooling. These changes take two forms: in the nature of teaching and in the nature of what it is possible to teach.

We have spoken largely of computers to this point. But computers occupy only one niche, if a currently dominant one, in the space allotted to information technology. Indeed, the title of this chapter suggests an antiquated notion that adding new technologies requires only that we find more AC outlets. In fact, the larger revolution is in terms of what is occurring in telecommunications technologies. In particular, the capacity of fiber optics to deliver huge quantities of information has led some speculators to conjecture that we currently have our future telecommunication systems reversed: Everything that is now sent through the air will eventually be sent via fiber optics, and everything that is presently delivered by wires will be sent through the air. Whether

this prediction comes true or not, clearly we are in for major changes in the way we use information.

Examples of what's available. To take a modest example, art teachers often use slides to accompany or drive their lectures. At the time this book was published, slides typically cost $1.50 to $2.50 each. The National Gallery of Art produced a single compact disc that contains 1,645 paintings, sculptures, prints, and drawings from its collection. While zooming in and out is not possible, many of the portrayals come with a variety of detail-oriented frames.

As a play-only disc, the product offers a five-minute history of the gallery followed by a tour of the 1,645 images. By dialing image numbers, viewers can organize the tour according to their desires. They can study, for example, how the portrayal of landscapes or the crucifixion or whatever changed over time or differed by country. When linked to an external computer, the images become a data base that not only can be organized according to the wants of the viewer, but through the use of programs known as "hypermedia," additional visual, textual, or auditory information can be added, as well.

While sound may not be so crucial to the viewing of paintings, it adds a major dimension to many programs in other areas. For example, for many species of birds, the rendering of their songs in print has always required imagination from the reader. A March 5, 1993, segment on National Public Radio's "All Things Considered" described a disc that provides an audio of the song along with pictorial and textual information.

Another example: The program "Dance of the Planets," a teaching program in astronomy, allows the user to leave the solar system and look back on it with all planets and the sun in view. The viewer of the skies can "walk around" the system observing what it looks like from a variety of perspectives. From any perspective, the 9,000 stars visible in the heavens are always in their proper positions. To watch how the relationships among the planets change, viewers can speed up the motion. Or, they can pick a date in the past or future and find instantly how the planets configured themselves or will be configured.

At the 1993 National Academy of Sciences conference, "Reinventing Schools: The Technology Is Now," attendees got glimpses of the sophisticated products not looming on the horizon but currently available. Among these was a disc that provides students with an enormous range of information about music and instruments. Students can choose to explore jazz, classical, and a variety of other musical styles. If jazz is chosen, small groups, swing orchestras—the

full range of styles—can be read about *and listened to*. If the students choose classical music, they can choose symphonies and chamber ensembles, among other selections. Within the symphony, the students can hear selections representative of various eras, and they can choose to study about and hear individual instruments within an orchestra. Another disc allows students to sing songs along with a disc in English or French while watching the words presented in both languages.

The conference, as well as various media published at the same time, was abuzz with talk about the "information highway" and the 500-channel "television" cable it portended. Although most examples seem to involve nothing more intellectual than ordering a movie on command and a pizza to eat along with it, the information highway will have, should have, major ramifications for education. The Mecklenburger Group, a nationwide group of technology-oriented educators, has begun to speak of developing, with deliberate allusion to Marshall McLuhan, "Global Village Schools," and to speak of school as a verb, not a noun.

Impact on Teaching

The classroom uses of the few examples given above go well beyond merely using a machine to present the same old curriculum. But will teachers use these programs? Three recent studies by different researchers—conducted at different times, using different methods—have produced startlingly similar and highly encouraging results about how information technology affects the nature of teaching.

Given computers and time (four to six years seems to be the needed interval, although one study found large changes in only two years), teachers will use the computers efficiently and radically change the ways in which they teach. When computers are first introduced, teachers use them to strengthen what they already are doing. Then the teachers begin to explore new uses and new ways of teaching.

The studies also found teachers:

- Teaching the whole class much less and working with small groups much more.
- Taking risks with their students.
- Viewing themselves more as coaches and facilitators than lecturers.

These changes are in accord with current teacher training arguments, as well as with findings in cognitive psychology.

Better relationships, more collaboration

As described in Chapter 4 in quotes from Deborah Meier, interactions between students and teachers and among teachers often lack a sense of authenticity. Students cannot admit they are having trouble. Teachers, even less so. Questions, the essence of problem solving, are seen in too many schools as either (inadmissible) admissions of ignorance or challenges to authority.

As one reads these reports, however, one strongly senses that introducing an alien object, the computer, into the classroom changes the power relationships among all actors. One report refers to the machine as "the great equalizer."[3] This is a new instrument in the environment; it is a puzzle. That it is foreign to teachers as well as to many students appears to allow teachers to say, "We're all in this together." One senses teachers mobilizing all resources available, almost like an immune system, to deal with the invader.

Rather than ejecting the foreign object from the system, however, teachers engage in a highly desirable collaboration with each other and the students to make the machine a known quantity. Indeed, this in itself, is no trivial outcome. Seymour Sarason, in *The Predictable Failure of School Reform*, predicates any successful reform on just such changes in power relationships between teachers and students, between teachers and administrators, and among teachers themselves.[4]

Further, the resulting changes in pedagogy are in line with the ones that most instructional reformers are calling for. Said one report:

> Collaboration among teachers was an additional aspect of productivity identified by many of the participating staff in each school. As specialization of computer skills emerged, teachers recognized that there was an instructional capability in-house. As a result, they could inquire and get support to learn new software and new skills, and receive help to accomplish tasks with programs they did not know well. These collaborative activities also established new relationships among the faculties that resulted in more productive work settings. Several teachers reported collaboration on course development, on the development of common classroom procedures, and on reducing the time necessary to accomplish necessary administrative tasks.[5]

Innovative teaching strategies

Changes in teaching were even more extraordinary. Said one teacher in

a representative comment, "As you work into using the computer in the classroom, you start questioning everything you have done in the past and wonder how you can adapt it to the computer. Then, you start questioning the whole concept of what you originally did." Wrote one set of researchers:

> [The computer] opened a path to a new instructional strategy that would engage students in a highly collaborative and creative activity. As teachers reached this stage independently of each other, their roles began to shift noticeably, and a new instructional pattern emerged. Team teaching, interdisciplinary project-based instruction, and individually patterned instruction became more and more common at all of the sites. To accommodate more ambitious class projects, teachers even altered that foundation of the traditional school day: the master schedule. . . . [Teachers were] more disposed to view learning as an active, creative, and socially interactive process than they were when they entered the program. Knowledge is now held more as something children must construct and less like something that can be transferred intact.[6]

Impact on Achievement, Students

None of these studies reports data on student outcomes, and perhaps, that is just as well at this time. Given what we have said about tests, it is clear that an assessment system that would do justice to the kinds of likely outcomes in these classrooms does not yet exist.

Reports from students would have been nice, though. In one school district, one teacher of a mixed fifth-sixth grade persuaded the district and Tandy Corporation to provide laptop computers for his students. During the first year, budget constraints limited the use largely to word processing, but the results in writing were dramatic.

The school was located in a middle class to poor area and test scores typically hovered around the 50th percentile. As part of a research project, the students' writing efforts were judged by teachers from other schools which served affluent families. Test scores at these schools were above the 80th percentile. The teachers did not rate the papers in comparison to their own students, but when asked about their quality pronounced them comparable to their students' average work. They were quite surprised when they learned where the papers came from.[7]

The students with computers also wrote more and much longer compositions than a comparable group without computers. They reported that having the computers, also used as calculators for math classes, made life easier and changed their attitudes about coming to school.

Perhaps the most telling datum concerning the impact of computers arrived inadvertently. As a result of a change in district policy, the fifth graders in the class, about 75 percent of the class, had an option to attend sixth grade in a middle school the next year or to remain in the elementary school for their sixth grade. An overwhelming majority of them chose the elementary school and often cited the computer as a factor in their decision.

The possibilities of hypermedia

Looming as a product that caught even the computer-using adult world unprepared and then took it by storm is "hypermedia." Hypermedia is hard to explain using plain media, and it is somewhat misleading as a word. It was coined following "hypertext," a word invented earlier to describe nonlinear text. Hypermedia tools allow the user to browse nonsequentially through text, pictures, and, in some instances, sound. Thus each person can peruse information following his or her own interests, not a predetermined sequence.

Hypermedia has proven useful and interesting in adult settings, but its use in schools is as yet largely unexplored. Some view it as the next great thing. Others view it with terror: The idea of children browsing through a program at will or at random horrifies them. They argue that children need structure and that without it, their learning will be chaotic.

The latter is a hypothesis, of course, and not a proven conclusion. As noted earlier, all people learn idiosyncratically to some extent. Whether or not hypermedia will increase the amount of creativity or leave people unable to communicate will likely depend on the design of the products. One researcher has reported that some early products leave people feeling lost in "hyperspace," which she describes as the feeling you get when you are lost in a British museum: You don't know where you are or what the hypermedia product's dimensions are.

To date, hypermedia are rarely found in schools. One study in what might be considered a hybrid application of regular text and hypermedia obtained results suggesting hypermedia can help learning. In this study in an elementary school, reading matter appeared on a screen in typical page sequence, but children could choose or not choose a variety of hypermedia aids in whatever

sequence they wished to help with the reading. The aids helped them to comprehend the text or to link pronouns to referents, or they pronounced difficult words for them. The children, in grades 1-3, were found to use the aids. Those who did and were in the program more than one year scored higher on reading tests than those who did not have the aids available to them.

Impact on Thinking, Schools

What computers will do to thinking is hard to predict. One parent, who also happened to be on the Harvard School of Education faculty, found that after her child had played a computer fantasy game in which the goal is to find a path to a treasure, he had constructed a geometry of what the fantasy world looked like. The parent felt it would be very hard for adults to construct that which the child had found easy. It may be that computers will fundamentally alter the way people think. It may also be that truly powerful software will arrive only after a generation raised on MTV and videogames starts making it.

A change in learner's relationship to knowledge

It is hard to overestimate the potential of these powerful machines and the nascent technologies surrounding them. Author Lewis J. Perelman, in *School's Out*, declares that the new technologies will render information so universally available that schools will soon be obsolete.[8] Certainly the onset of "smart houses" equipped with computers, interactive videodiscs, software, with some built-in data bases and on-line access to others, can—will—make much more knowledge readily available and will change the learners' relationship to knowledge.

Change in information processing

As we move into a more multimedia, less book-based culture and education system, we may witness, may have already witnessed, important changes in how children process information. The impact of television has been decried in many quarters, although its impact, at least as measured by test scores, is as yet indeterminate and complex. However, not only do children watch a great deal of television and videotape at home, they will experience multimedia in schools.

The impact of such experiences cannot fully be foreseen. Consider, for example, a group of gifted eighth-graders this author studied in a Rhode Island school. As one project, the students studied the search for the *Titanic*. Instead of simply reading about the events and taking notes, they:

- Watched "A Night to Remember" and "20,000 Leagues Under the Sea."
- Visited the nearby Woods Hole Oceanographic Institute and videotaped an interview with Robert Ballard, the man who led the search.
- Organized themselves into teams to search for the Titanic using a computer simulation. And to complete the project, the students constructed a multimedia, hypermedia exhibition to show the other students in the school what they had been up to. Teachers of science, mathematics, literature, and physical education altered their courses to coordinate instruction with the project.

A new "literacy." In one sense, these students may be less "literate" than they would have been had they spent the same amount of time simply reading about the project and writing individual reports. Their SAT verbal scores, dependent on written texts, may actually suffer. But it would be difficult to conclude that their experience was less intellectually rich or rigorous than one restricted to print media. It may turn out that the definition of "literacy," or at least the traditional value of traditional literacy, may be obsolete.

These students' experiences, of course, are precisely what psychologists would say produce the most meaningful, long-lasting knowledge and skills. Unlike the unthinking science experiments described earlier, these students experienced the reasoned trial-and-error inherent in simulations and in science itself. Not measured in any outcome is the impact of the teachers' great enthusiasm for the project on the students' impressions of what learning is all about.

Many experts in the communications field agree that the changes in information processing produced by the new technologies will be profound, but not necessarily negative. Mitchell Stephens of New York University in "The Death of Reading" concludes that reading will not die and may even prosper. We cannot know at this time how the new technologies will develop:

> And even those who believe that the decline in reading does herald some profound cultural changes are not convinced that those changes will necessarily be for the worse. Perhaps, they might argue, the logic inculcated by writing and print is not the only way of processing information about the world. Perhaps an immersion in electronic forms of communication might lead to different but equally valid ways

of being smart—forms of intelligence that go unrecognized by SAT tests. 'I'm listening to that argument with more and more sympathy,' concedes [Donald] Stewart, [president] of The College Board.

It is possible, moreover, that electronic forms of communication have more potential than is currently being expressed in either the vapid fantasies of Madonna videos or the static talk shows and costume dramas of public television. These media might be capable, given time, of creating a culture as profound and deep as that of reading. . .

It took 2,000 years of writing before an alphabet was developed. It took a century and a half of printing before someone thought to print a novel or newspaper. New communications technologies do not arrive upon the scene fully grown; they need time to develop the methods and forms that best exploit their potential.[9]

In any case, the possibilities briefly discussed in this chapter are a long way off. A study of international use of computers in education finds that, indeed, the United States was the first country to buy many computers for use in schools.[10] Paradoxically, this now leaves us behind other countries. Because of their delays, other nations have purchased 16-bit and 32-bit machines while the 8-bit computer, exemplified by the various models of the Apple II, remains dominant in American schools. And, as one wag put it, 8-bit computers are barely worth two bits any more. Yet only 3 percent of computers in schools are 386 or 486 machines, while another 10 percent are Macintoshes.

The speed with which information technology becomes obsolete poses a new problem for schools. Advances in television just meant better pictures and sound. Progress is towards a known ideal. Advances in information technology, on the other hand, permit qualitatively different activities, allowing us to do things never before done. This means rapid obsolescence of machines. One school district, Carrollton, Georgia, which has 1,600 computers for its 3,400 students and a network to link them, finds itself "trapped" by its own successes—unable to do what it wants to, what it thinks it needs to do to maximize its use of the technology. The mostly, 80286 machines lack the size and speed to carry out the district's goals. So does the network. It is estimated that Carollton will need to spend 7 to 10 percent of its budget on information technology to keep current. Compared to expenditures in private industry, this is not an unreasonable outlay, but it is one that schools have not faced or committed to before.

The study of computer use around the world and in the United States

reveals again what Becker had noted earlier: In many instances, computers have not become integral parts of instruction. Few students reported using them for more than one subject area. In addition, while American students report more computers available than do students in other countries, they also report more difficulties in gaining access to them. They also report fewer computers at home and, even when computers are available at home, American students are less likely to use them than are students in other countries. The evidence indicates, then, that for most school children, the information millennium will have to wait.

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EPILOGUE

We end this treatise here not because the entire system has been described. It has not. But a sufficient number of systemic components and their needs have been examined, with the aim of giving impetus to any number of reform efforts. We hope this furthers the dialogue on reform and helps the reader focus on some areas much in need of improvement, while pointing out that all is not lost in the cause of education.

Perhaps another publication might examine reforms needed in curriculum, for various age levels; or in the role of school boards or in the preparation of teachers. (We have a long, sad history of staff development "days.") This book, however, has shown the system as an interlocking mechanism that must be examined in its entirety to make real change happen.

ABOUT THE AUTHOR

Gerald Bracey is a native of Williamsburg, Virginia, and attended the College of William and Mary there as an undergraduate before going on to obtain a Ph.D. in psychology from Stanford University.

After serving as a research psychologist in the Early Education Research Group at Educational Testing Service, Bracey became the associate director of the Institute for Child Study at Indiana University in Bloomington. In 1965 and 1966, Bracey spent a year abroad, living in Hong Kong and traveling widely in Southeast Asia, the Middle East and Europe, before returning to finish his doctorate. In 1973, he resigned his position at Indiana and eventually became the Director of Research, Evaluation and Testing for the Virginia Department of Education. He later held a similar position at Cherry Creek School District near Denver, Colorado.

Bracey is recognized as a pioneer in the area of alternative assessment and has written numerous articles on the subject. He conducted a series of alternative assessment workshops in 1990 in various Colorado cities for the Colorado Association of School Executives.

Bracey also maintains an active interest in the use of information technology in education. He serves on the national advisory committee of the Hague-based Second International Study of Computer Use in Education and is a member of The Mecklenburger Group, a nationwide group of a dozen technology-oriented educator-consultants.

For the last ten years, Bracey has written monthly columns on various aspects of policy analysis, mathematics reform, research, assessment, and technology in about 25 different periodicals, including *Phi Delta Kappan* and *Electronic Learning*.

In recent years, Bracey has become known as a policy analyst as well as a researcher and writer. His work in this area, "Why Can't They Be Like We Were?" drew the attention of *The New York Times*, *The Washington Post*, *Education Week*, and *USA Today*, as well as the wrath of the Bush administration's Department of Education. "The Second Bracey Report on the Condition of Public Education" was featured in a long interview on National Public Radio's "Morning Edition." "The Third Bracey Report" has spurred a number of newspaper articles and speaking engagements around the country.

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—Gerald W. Bracey

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